

Leadership and Management,
The solution to the
Construction Industry crisis

BY

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ABSTRACT

(1) The business roundtable report describes the construction industry as an industry in crises. The crisis is centered on the downward trend in quality and productivity, the dwindling numbers of trained, skilled craftsmen, and the uncontrolled, escalating cost of construction. The issue is very complex, and complex problems, typically, have complex solutions. It is not my contention to trivialize the problem with simplistic observations but to hopefully shed the light of common sense and understanding that might lead to viable solutions. The focus of the roundtable report is economic in nature; the crisis is defined and described in economic terms. In this report the economic crisis is translated into the terms of a moral crisis. The Business Roundtable Report also goes to great lengths rationalizing the problems in the industry by using the make up of the industry as an excuse for poor performance. (1) "It's that way because we are set-up different from other industries like manufacturing and sales", and there I believe is the genesis of the problem. This quote is in essence accepting the circumstances and limiting the potential solutions.

Before effective change can happen, there must be an understanding that change is required. Fulfilled potential comes from the potential of unlimited change.

This report is not the big picture fix to the complex issues of the industry, but more of a beginning of how individual leadership skills affect our industry, and how the development of those skills during the education process will lead to viable solutions. The research begins with a discussion of integrity, ethics, and character leading to a working definition of leadership. The working definition of leadership is used to measure the ability of the education process to develop the industry's future leaders. The measurement was accomplished by surveying the Leadership and Management attitudes among current graduate students. The results show that the students surveyed believe additional exposure to Leadership and Management training is required. A global search on the World Wide Web detail a wide spectrum of Co-op solutions currently being utilized by Universities all over the world.

KEY WORDS: Construction Management, Leadership, and Integrity

Section One: Introduction

- Leadership, a common sense concept
- The definition of Leadership
- Defining the problem
- Leadership, the solution

LEADERSHIP, A Common Sense Concept.

The most difficult aspect of this report is defining the need for this research in a way that will make the reader want to continue reading. What this report prescribes is not easy. Leadership is hard work but can be found in the very core of who we are as individuals. The easiest way to start this discussion is to discuss what this report is not. This report is not a new and improved, faster, quicker, method to solving all your construction management woes. It is not the low overhead, slot "A" into tab "B", quick fix to your supervisory needs. There are no thirty-day guarantees or your money back. There are no new great revelations. Some will even say it's just common sense and they would be right. Stephen Covey responds to this common sense observation with this quote ⁽²⁾ "Sounds like common sense that begins to resemble the wisdom found in traditional cultures and ancient writings, rather than something "new". The problem is, common sense is not always a common practice."

The Definition of Leadership.

It is very difficult to define leadership in simple terms. Leadership is a very subjective topic. I like

Blaine Lee's definition of leadership ⁽³⁾ "Leaders have all the spontaneity, unpredictability, frailty, vulnerability, and potential that is possible in the human race. If we are to lead with honor, we must start with the premise that flexibility, adaptability, and wisdom are possible, that we all have the seeds of greatness in us, and that we care deeply about the lives of others, we can work together to accomplish worthwhile things". Admiral John Paul Jones defines a leader this way, ⁽⁴⁾ "A leader should be the soul of tact, patience, justice, firmness, and charity. No meritorious act of a subordinate should escape his attention or be left to pass without its reward, even if the reward is only a word of approval. Conversely, he should not be blind to a single fault in any subordinate, though, at the same time, he should be quick and unfailing to distinguish error from malice, thoughtlessness from incompetence, and well-meant shortcoming from heedless or stupid blunder". ⁽⁵⁾ In the words of W. Edwards Deming: "The aim of leadership should be to improve the performance of man and machine, to improve quality, to increase output, and simultaneously to bring pride of workmanship to people. Put in a negative way, the aim of leadership is not merely to find and record failures of men, but to remove the causes of failure: to help people to do a better job with less

effort." For the purpose of this report I will define leadership as the combination of several factors. These factors are ethics and morality, character and integrity, and principles.

Defining the problem.

But first, why focus on leadership in the construction industry, why now? There are a multitude of contributing factors for the decline of quality and productivity in the construction industry. This report will attempt to focus the basic principles of leadership to problem areas within the construction industry. It is my contention that the solution for many of them can be found in well-grounded, principle centered leadership.

⁽¹⁾ The Business roundtable discusses in depth the problems associated with the construction industry. The issue is very complex, ranging from cost over runs, decline in quality, to an unmotivated work force. One major concern is that people in the industry use the complexity of the problem as an excuse or a crutch to continue doing what they always have done. The solution to a complex issue is just as complex but I believe that before the Industry endeavors to reinvent itself we should focus on "doing the right thing". But, what is the right thing?

Leadership, the solution to the construction industries problems?

As recognized in the military, the greatest asset within the construction organization is the individual worker. The industry problems can and should be solved by focusing on utilizing its greatest asset. Proper leadership and management can accomplish this. Leadership is the ability to influence people so that they willingly and enthusiastically strive toward achievement of common goals. ⁽⁶⁾ The job of a supervisor is not to tell people what to do nor to punish them but to lead people. Leading consists of helping people do a better job. So, developing the industry's future leaders will be the solution to the industry's problems.

Character trait applied to the construction industry.

An easily identifiable example of the concept of strong character is that of job site safety. ⁽⁴⁾ A leader must develop a strong character, including moral responsibility. Insuring that every person on the site works in a safe manner regardless of the stress of impending times constraints. If a supervisor wavers on

this issue it can have disastrous consequences.

Sometimes with the pressures and stresses of the job site the only thing the supervisor has to fall back on is his/her moral character to do the right thing and run a safe site regardless of the impact on the project. When and how do we currently teach the construction leaders how to deal with the stresses of the job site? The answer is we don't, the industry uses practical experience to be the guide. So it stands to reason the sooner this practical experience begins the better equipped the new leader will be equipped to deal with pressures of the job site.

A construction example of how principles affect the job-site.

Leadership without principles will be found wanting. A leader that places his principles and the well being of his workforce at the top of his priority list is bound for success. ⁽⁴⁾ A leader that follows the principles of knowledge, character, personal style, and vision will be an effective leader. An example of this attitude is the prospect of "Do as I say, Not as I do". If a worker observes his supervisor fooling around and not being fully productive then the worker will use that observation as permission to do the same. The supervisor will have a

very difficult time managing this situation because his own actions have supported the circumstances. The solution is simple, open communication, the supervisor should honestly admit to not being fully employed, there is nothing wrong with having some fun on the job-site but it's now time to go back to work.

Integrity, the foundation of principal centered leadership.

The concept of personal integrity is more difficult. What makes a successful leader, Field Marshal Montgomery believes it is ⁽⁴⁾ "The capacity and will to rally men and women to a common purpose, and the character which will inspire confidence". This definition discusses two important factors, integrity and character. Integrity and character are the foundation of principled centered leadership. An example from the construction site is the acceptance of responsibility. If a foreman blames the lateness of a project on the productivity of the crew to cover his own shortcomings, this supervisor will have a very difficult time getting this crew to follow or trust him in the future. People will not follow a leader who lacks integrity and character. My favorite definition of integrity is by Admiral Arleigh Burke.

(4) "First you find yourself overlooking small infractions that you would have corrected on the spot in the past.

Soon, you are a participant in these infractions.

"After all," you say, "Everybody's doing it."

All too soon you find yourself trapped: You no longer can stand on a favorite principle because you have strayed from it.

Finding no way out, you begin to rationalize, and then you are hooked.

The important fact is, the men who travel this path outlined above have misused the very basic quality and characteristic expected of a professional military man, or any other professional man for that matter:

They have compromised their integrity."

Once integrity and character have been compromised it is gone and cannot be renewed or replaced. An example of this on the construction site is "cutting corners" or deviating from the plans and specifications without proper authorization. When a worker sees his supervisor deviating from standard practices, his view of the supervisor changes. The supervisor's actions are unspoken authority to the workforce that it is acceptable to "do the wrong thing". How can a supervisor correct a worker's

work practices after such action? He cannot. His own action has undermined his authority over his work force.

Acknowledging Leadership Styles.

There are volumes of books dealing with the research and studies of different leadership styles. Jung stated that ⁽⁷⁾ "People are different in fundamental ways even though they all have the same multitude of instincts to drive them from within. One instinct is no more important than another is. What is important is our preference for how we function". A leader must acknowledge and recognize the characteristic preferences of everyone around them and use this information to maximize creativity and productivity on the construction site. This concept is summarized nicely by Blaine Lee who believes that ⁽³⁾ some people need instruction, while others can participate with you in decision making. Some need coaching, some need directing, some will do things on their own, and some will accept responsibility that comes with delegation. Leadership then becomes the set of activities you would engage in to optimize the connections between the task, the followers, and the circumstances; what you do as a leader is contingent upon those you want to lead and what you are trying to accomplish. The theory

of the dog chasing his tail is an excellent example of this principle. The theory is simply, an activity on a project is late, and the foreman moves all assets on site to that activity to get back on schedule. The movement of the assets impacts a different activity, so the foreman moves all assets to cover this activity, which impacts a different activity and so the project goes, the foreman is no longer a project manager he is a dog chasing his tail. No matter how much he tries, no matter how much effort he puts into it he will never catch his tail. The solution is easier stated than put into practice. The solution is the foreman must stay focused on the big picture.

Accountability in Leadership.

The best ideals of leadership fail if there is no accountability to the process. An industry driven by the bottom line places young leaders on the front line and measures their success by that bottom-line. Deming discusses this idea in the following example, ⁽⁵⁾"Rather than helping workers do their job correctly, most supervision accomplishes just the opposite. Often supervisors, hired straight out of college, don't know the work they supervise. They have never done the job". How can someone be accountable for a process if they do not

fully understand the process? The solution to this dilemma is short and succinct. ⁽⁴⁾ "Know yourself, know your people, and know your job", then success will follow. If you do not know ASK. The more experience encountered during the education process the smoother the transition to Principle Centered Leadership.

Who are the leaders on a construction site?

Who does leadership apply to? An interesting observation is that none of the leadership factors have anything to do with actually doing work. Mary Walton in the Deming Management Method states that ⁽⁵⁾"Leadership is the job of management, it is only for supervisors". I do not totally agree with this assessment. Yes, it clearly belongs with the supervisor but I think that leadership is grounded in doing the "right thing" and applies to everyone regardless of his or her station in life. If everyone did the "right thing" all of the time then leadership would be easier. Who does leadership apply to, it applies to everyone. And it doesn't only apply at work; it is part of everything we do. For the purpose of this research, the focus is on the middle managers of the construction industry.

But how do we "do leadership" where do we learn the skills? I once asked a Marine Gunnery Sergeant "How do you know when you are doing leadership?" you will know, you will feel it your gut, if you don't feel it, you are not doing it. ⁽³⁾ Leaders who operate from a base of principles centered power can make a significant difference because of what happens to the people who follow them. Those people become more productive. Before the industry spends a bazillion dollars studying ways to reinvent itself, I suggest we just try doing the right thing. How do we do this? Where do we start? The remainder of this report is the beginning. It will focus on education, specifically two areas: the practical experience on the job-site and formal education in the classroom.

Section Two: Population Survey

- The Survey
 - Creating the forms
 - Guidelines for interpretation
- Those Surveyed
 - Gender
 - Age
 - Employment
 - Professional Registration

The Survey

The survey, (a blank copy can be found in Appendix "A"), was created using the "Questionnaire Survey Research" written by Linda Suinie as a guide. This reference discusses how to ask the right questions, how to ask them in a way that would be user friendly to the individuals being surveyed. It also goes into great lengths in detailing how to lay out the questions in a way the data can be easily compiled for data analysis. Appendix "A" is a compiled list of the results of the survey.

Guidelines for interpretation

The answer choices in this survey were chosen for specific reasons. Surveys typically have five answer choices to select from but this survey has only four answer choices. This was done to make the individual being surveyed make a choice. There is a tendency for the person being surveyed to choose the non-committal middle of the road answer if they are not sure of the right answer. With only four answer choices they cannot do that, they have to pick one which makes the individual think and doesn't allow them to sit on the fence.

The language used in the answer choices was defined to those being surveyed as:

| | |
|--------------------|------------------------------------------------------------------|
| Not at all- | no, never, doesn't happen |
| Undecided- | not really, sometimes |
| Somewhat- | occasionally, wants to think so but not as often as it should |
| Absolutely- | 100% sure, all of the time |

The survey itself is broken into three sections:

1. Personal information on the individuals being surveyed. These results graphically illustrate the make-up of those surveyed.
2. This section of questions is of the individuals evaluating themselves. Measuring their actual education experience in Leadership and Management against their own expectations.
3. This type of question is asking the individual to evaluate their education with respect to developing Leadership and Management traits.

The following section will discuss each question individually. It will discuss why the question was included in the survey and how it will be interpreted.

Question One: Are you currently motivated for a position in the Construction Industry?

This question was asked to see if the student still wanted a career in the construction industry. Sometimes the education process can burn out a student from the subject. The results will be evaluated on a strict percentage basis.

Question Two: Do you feel your education has prepared you to motivate workers on the job?

Engineers are leaders by definition; they lead a group of people to a common goal, the project. This question specifically measures if the student feels they are prepared to take on this task.

Question Three: Do you feel you are prepared to be a leader in the Construction Industry?

Again, this is a specific question measuring the student's feelings of adequacy with respect to being a leader in the construction industry.

Question Four: Has your education adequately presented the different types of leadership styles?

This question is trying to measure the depth of leadership training that was included in the theoretical or classroom part of their education.

Question Five: My education has taught me how to identify, and how to do the right thing.

Nebulas question trying to determine the level of moral and ethical training during the theoretical part of their education.

Question Six: I feel I have the tools to problem solve a work process.

This question is trying to evaluate the students confidence level is solving work processes.

Question Seven: My education has empowered me with the tools to properly manage my time.

This question is trying to measure the individual student's confidence in managing their time.

Question Eight: My education has empowered me with the tools to properly manage the time of others.

This question is coupled with the previous question and is trying to determine the level of confidence of individual and group time management.

Question Nine: My education has empowered me with the tools to properly manage my money.

This question is trying to measure the individual student's confidence in managing his or her own money.

Question Ten: My education has empowered me with the tools to properly manage the money of others.

This question is coupled with the previous question and is trying to determine the level of confidence of individual and group money management.

Question Eleven: Do you feel the subjects of Leadership and Management was adequately covered during your education?

This question is trying to determine if additional Leadership and Management training is required.

Question Twelve: Do you feel additional courses in Leadership and Management is required? Y/N, If yes during Grad/Undergrad.

This question is coupled with the previous question and is trying to determine where in the curriculum additional training is required.

Question Thirteen: Do you believe your education has prepared you for a position as a manager in a construction organization?

This question is trying to evaluate the individual Confidence with regards to being prepared to work as a manager in the Construction Industry.

Question Fourteen: Would you participate in an Engineering/Construction Co-op if it were available?

This question is testing the waters for future work-study programs. It is trying to determine how the students would receive a work-study program.

Those Surveyed

The following data is an analysis of who was surveyed. Understanding the make-up of who was surveyed is just as important as what they had to say. This is

the first step in analyzing the results. This is important because you can ask all the right questions but if you do not ask the right people the results are meaningless. The target group for this research is seniors and graduate students. The intent is to evaluate their Leadership and Management skills at the end of their education.

The following categories were used in developing the user profile: gender, age, professional development, class level, and work experience.

Sex: M/F

Male Female

80.00% 20.00%

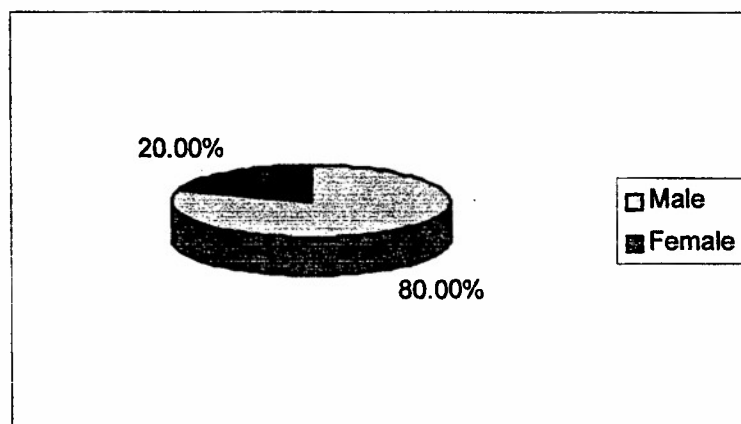


Figure 2.1 Gender make-up of the Survey

Eighty percent of the people surveyed were men, which is consistent with the gender mix attending graduate school at the University of Florida.

Age

| | | | | |
|--------|--------|--------|-------|-------|
| 20-25 | 26-30 | 31-35 | 36-40 | 41+ |
| 58.00% | 18.00% | 14.00% | 6.00% | 4.00% |

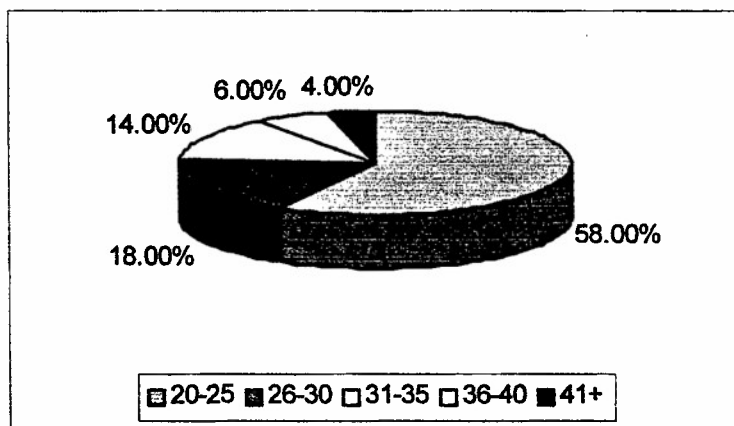


Figure 2.2 Age Distribution

The ages of those surveyed are predominately in there 20's. The 24% in there 30's can mostly be attributed the United States Navy personnel currently attending the University of Florida. There are ten Navy personnel in there 30's and 40's. What the age graph really shows is that most of the graduate students attending Graduate School at the University have matriculated from their undergraduate program. This is an important point with respect to developing Leadership and Management skills.

Graduate Student/ Undergraduate Student

| Grad | Undergrad |
|--------|-----------|
| 80.00% | 20.00% |

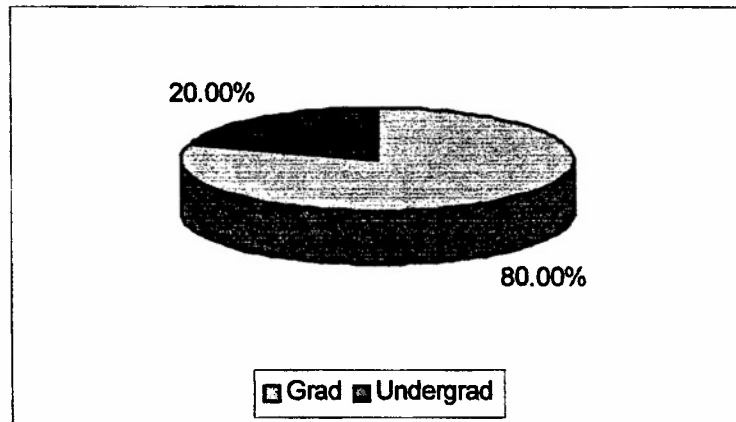


Figure 2.3 Education Level

All of the students surveyed were either a senior or a graduate student. This was purposely done in an effort to measure the student's skills in Leadership and Management at the end of their college education.

Professional Development:

EIT: Y/N

Yes No

70.00% 30.00%

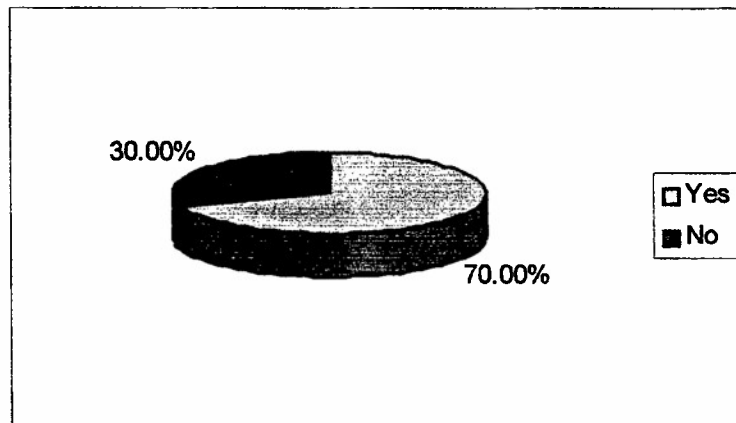


Figure 2.4 Passed EIT

Professional Engineers License

Yes No

10.00% 90.00%

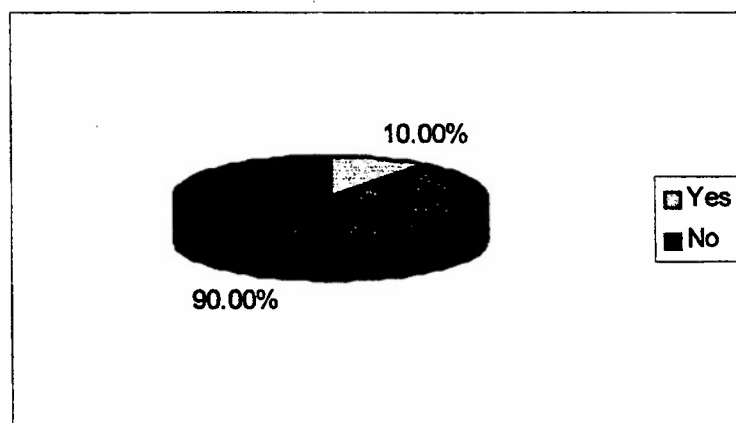


Figure 2.5 Passed PE

Seventy percent of the people surveyed have their Engineer in Training (EIT) which is an excellent percentage for a graduate program. The EIT is an excellent benchmark for measuring the professional development of an individual engineer. Only ten percent of those surveyed have their PE. This not a surprise because most require significant experience before you can take the PE exam. As we have already discussed most of those surveyed have matriculated from their undergraduate program so they have not had the opportunity to gain any actual work experience.

Work Experience

Are you currently employed: Y/N

| Yes | No |
|--------|--------|
| 62.00% | 38.00% |

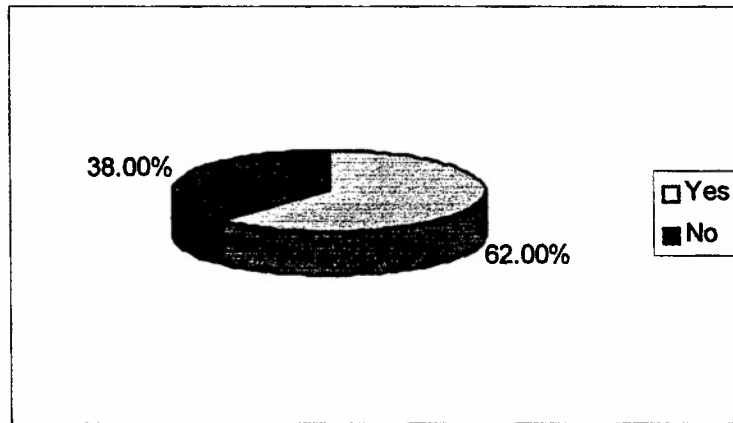


Figure 2.6 Employment Distribution

Employment information is vital to determining the viability of any kind Leadership and Management program. This graph shows that sixty-two percent of those surveyed are already working, of those who are currently employed sixty-one percent are not working in the construction industry.

Is your Job in the Construction Industry: Y/N

| | | |
|--------|-------|--------|
| Yes, | Yes, | No |
| Navy | Other | |
| 32.26% | 6.45% | 61.29% |

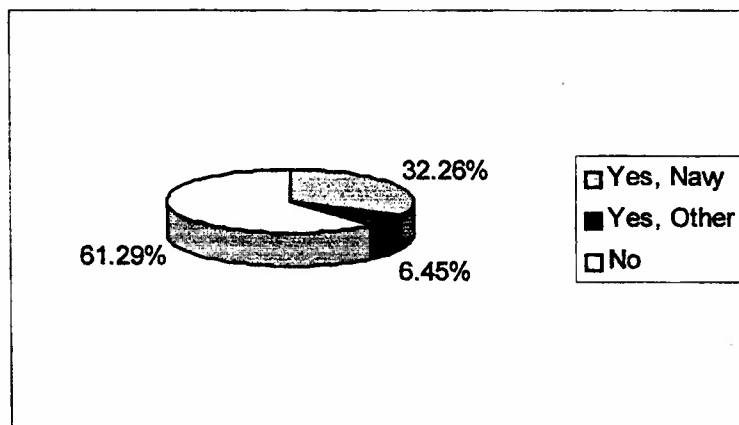


Figure 2.7 Construction Experience

Thirty-two percent of those who are working in the construction industry are in the Navy. If you take the Navy personnel out of this discussion it changes the numbers to Ninety-four percent of those surveyed who are currently working are not working in the construction industry. This is a staggering statistic. Nine out of ten of those surveyed that are currently working are not working in the construction industry. These are individuals who have Engineering Degrees but are not working as Engineers.

The following case studies are individual interviews I conducted to further demonstrate this point. No names are used to protect the privacy of the individuals involved.

Case Studies:

Two young ladies with a Bachelors degree in Civil Engineering from the University of Florida with a specialty in Materials Science. Their Graduate focus is in Asphalt. They have never seen an actual asphalt batch plant. They have never actually seen an asphalt paving machine. They can identify the parts from a picture but have had no practical experience in any part of the asphalt industry. They feel their education would have been enhanced with more practical experience.

A young lady with a Bachelors degree in Civil Engineering from the University of Florida. She is currently a full time student as a graduate student in Construction Management. She is also currently a full time employee at a local delicatessen. She has no practical engineering experience at all. Believes her current job is meaningful job experience but acknowledges lack of construction experience.

A young man with a Bachelors degree in Civil Engineering from the University of Florida. He is currently a full time student as a graduate student in Construction Management. He is also currently a full time employee at a local drinking establishment-tending bar. He has no practical engineering experience at all.

It is accepted that there are benefits gained from any kind of work experience, but by not working in the industry they lose the benefit of being in the construction environment. It is only in this environment where you learn the terminology and experience the day to day problems encountered on the construction site.

Section Three: Data Analysis

- Question
 - Numerical Response
 - Graphical Response
- Interpretation of Results

Section Three: Data Analysis

The format for analyzing the data is as follows. The analysis was done on a question by question basis. Each question will be annotated followed by the numerical breakdown of how the question was answered. This will be followed by the graphical representation of the numerical answers. A short narrative interpreting the results for that specific question will follow this.

Example:

Question X

Numerical Response:

Graphical Response:

Interpretation of Results:

Question One:

Are you currently motivated for a position in the
Construction Industry?

Numerical Response

| N/A | Not at all | Undecided | Somewhat | Absolutely |
|-------|------------|-----------|----------|------------|
| 2.00% | 12.00% | 12.00% | 26.00% | 48.00% |

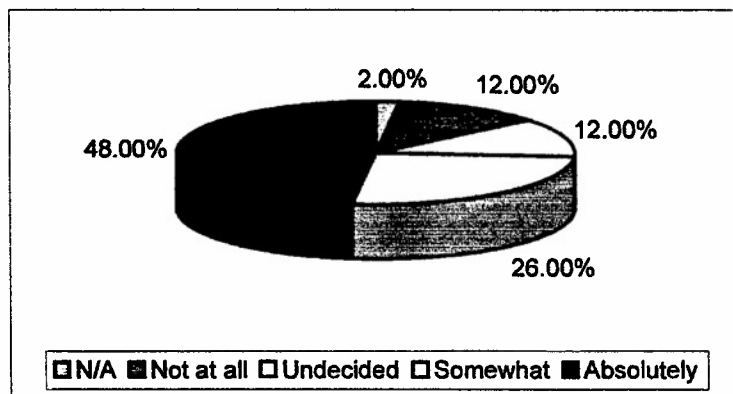


Figure 3.1 Motivated to work in the Construction Industry

Interpretation of Results:

Clearly 74% of those people surveyed believe they are still highly motivated to work in the Construction Industry. This is an excellent measurement for how the education process is doing overall.

Question Two:

Do you feel your education has prepared you to motivate workers on the job?

Numerical Response:

| N/A | Not at all | Undecided | Somewhat | Absolutely |
|-------|------------|-----------|----------|------------|
| 4.00% | 16.00% | 20.00% | 46.00% | 14.00% |

Graphical Response:

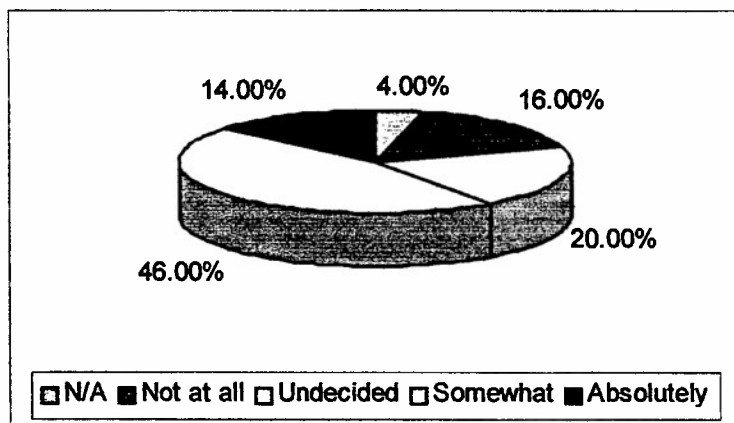


Figure 3.2 Prepared to motivate workers

Interpretation of Results:

Only 14% are completely positive they have the skills to motivate workers. 36% are showing a negative response to being prepared to motivate others. 46% are on the fence to possessing motivation skills. This is an important skill that is finely tuned over years of experience. Clearly the earlier in the leadership development these skills begin the better.

Question Three:

Do you feel you are prepared to be a leader in the
Construction Industry?

Numerical Response:

| N/A | Not at all | Undecided | Somewhat | Absolutely |
|-------|------------|-----------|----------|------------|
| 6.00% | 8.00% | 6.00% | 44.00% | 36.00% |

Graphical Response:

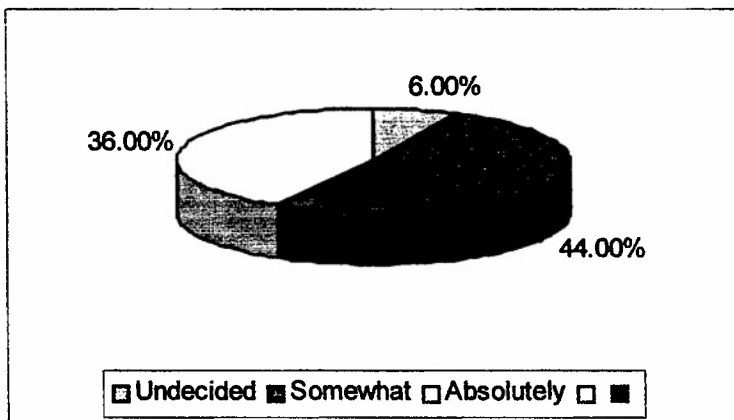


Figure 3.3 Prepared to be a Leader in the Construction Industry

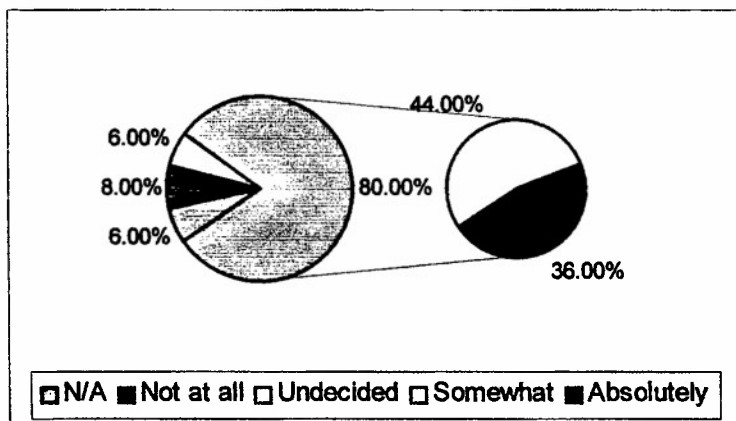


Figure 3.4 Distribution of Leadership data

Interpretation of Results:

The majority of those surveyed believe they are prepared to be leaders in the construction industry. This is a very interesting data point because it is a contradiction to the previous graph on motivation. Here 80% believe they are prepared to be a leader but as discussed earlier they are not prepared to motivate workers on the job site.

Question Four:

Has your education adequately presented the different types of leadership styles?

Numerical Response:

| N/A | Not at all | Undecided | Somewhat | Absolutely |
|-------|------------|-----------|----------|------------|
| 6.00% | 40.00% | 18.00% | 30.00% | 6.00% |

Graphical Response:

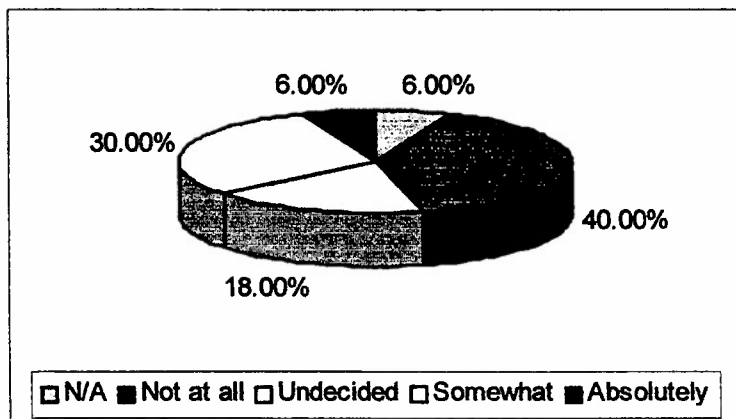


Figure 3.5 Adequately presented Leadership Styles

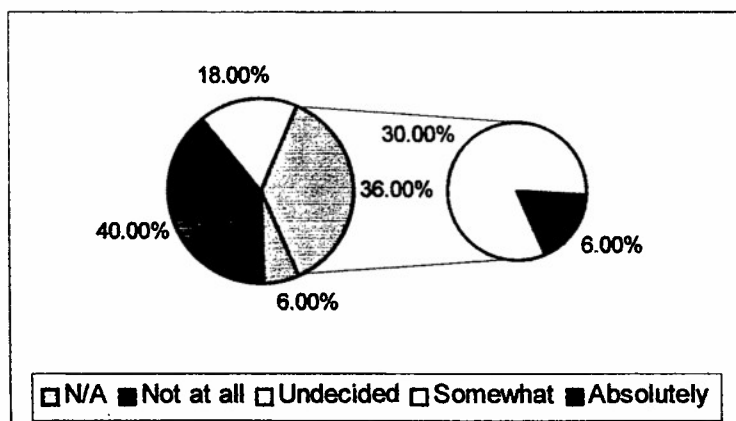


Figure 3.6 Distribution of Data on Leadership Styles

Interpretation of Results:

This graph measures the adequacy of the student's education with respect to leadership. Only 6% believe their education adequately presented the different styles and types of leadership. This is important because this question specifically addresses the theoretical side of Leadership and Management education.

Question Five:

My education has taught me how to identify, and how to do the right thing.

Numerical Response:

| N/A | Not at all | Undecided | Somewhat | Absolutely |
|-------|------------|-----------|----------|------------|
| 2.00% | 8.00% | 14.00% | 58.00% | 18.00% |

Graphical Response:

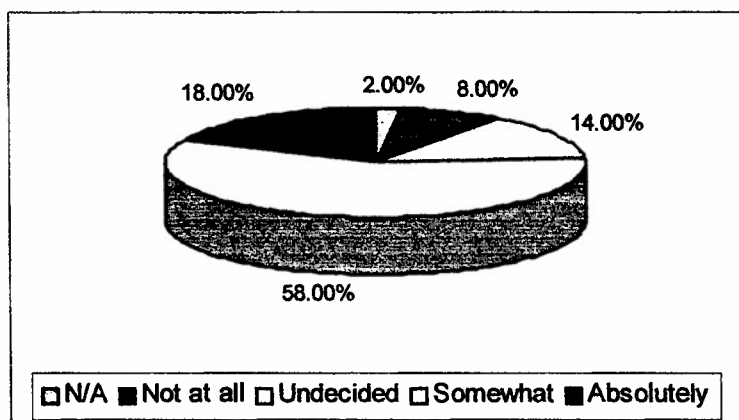


Figure 3.7 Do the Right Thing

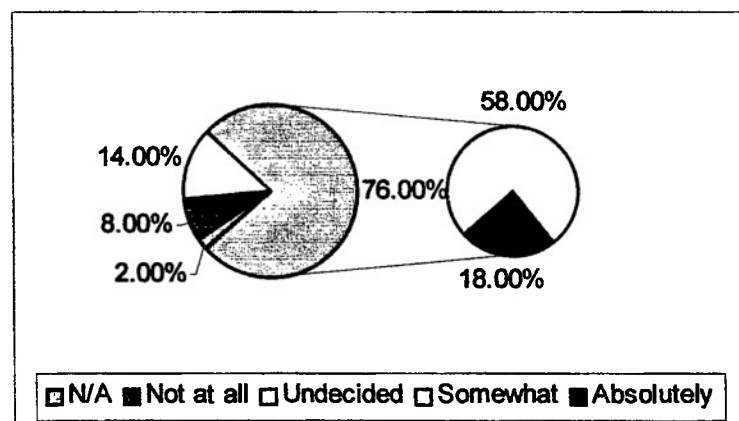


Figure 3.8 Distribution of Do the Right Thing Data

Interpretation of Results:

The right thing to do is a very vague concept. It was defined to those surveyed as the ability to positively influence a situation. 22% believe they are not prepared to do this. I believe this is in large measure because of the lack of practical experience.

Question Six:

I feel I have the tools to problem solve a work process.

Numerical Response:

| N/A | Not at all | Undecided | Somewhat | Absolutely |
|-------|------------|-----------|----------|------------|
| 2.00% | 0.00% | 6.00% | 40.00% | 52.00% |

Graphical Response:

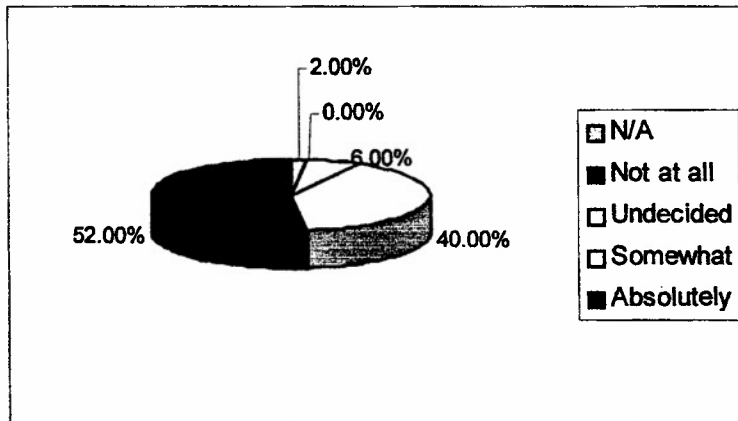


Figure 3.9 Problem solving a work process

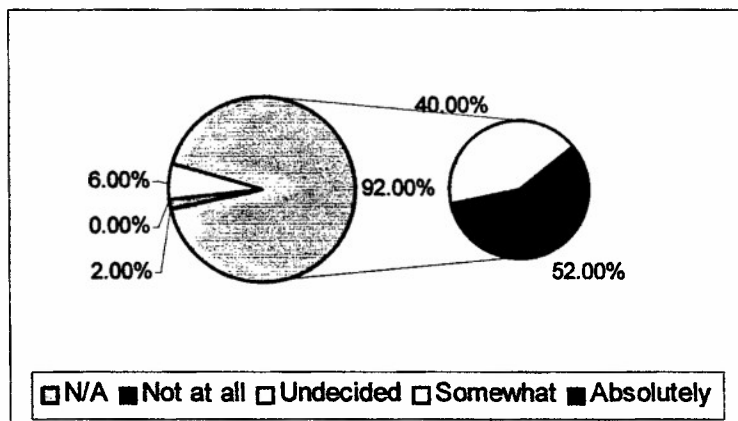


Figure 3.10 Distribution of work process data

Interpretation of Results:

92% believe they are prepared to solve a work process.

This is one of the few questions that had nobody vote for the "not at all" category. This question is an excellent measure of the success of the theoretical process founded in the engineering curriculum.

Question Seven:

My education has empowered me with the tools to properly manage my time.

Numerical Response:

| N/A | Not at all | Undecided | Somewhat | Absolutely |
|-------|------------|-----------|----------|------------|
| 4.00% | 10.00% | 2.00% | 34.00% | 50.00% |

Graphical Response:

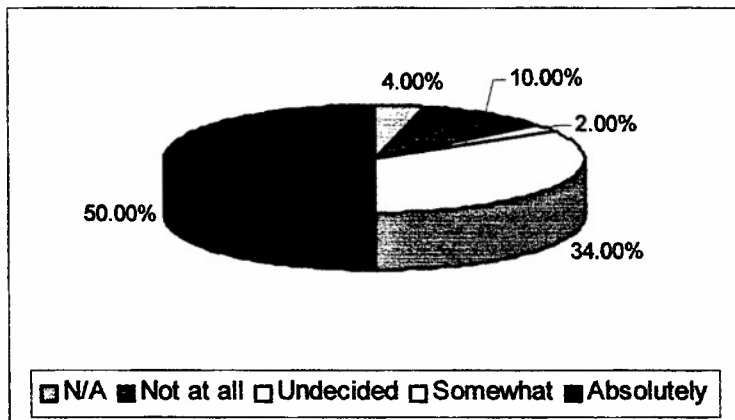


Figure 3.11 Personal time management

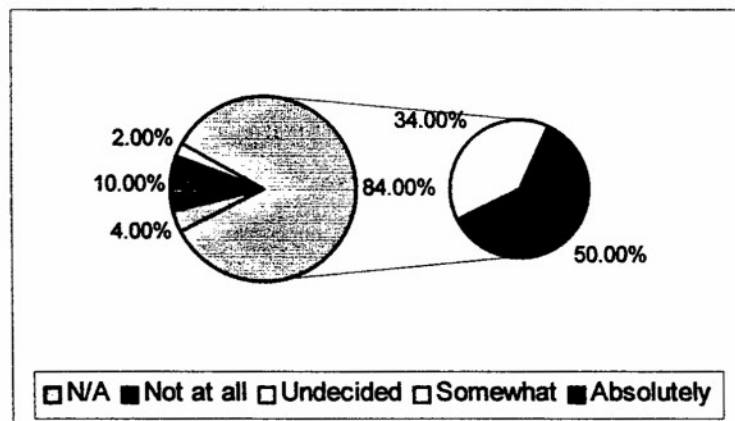


Figure 3.12 Distribution of personal time management data

Interpretation of Results:

84% believe they are the prepared to manage their own time. This can be attributed to the students maturing as individuals as they progress through the engineering curriculum. A concerning point is that 12% do not believe they are capable of managing their own time.

Question Eight:

My education has empowered me with the tools to properly manage the time of others.

Numerical Response:

| N/A | Not at all | Undecided | Somewhat | Absolutely |
|-------|------------|-----------|----------|------------|
| 4.00% | 18.00% | 18.00% | 42.00% | 18.00% |

Graphical Response:

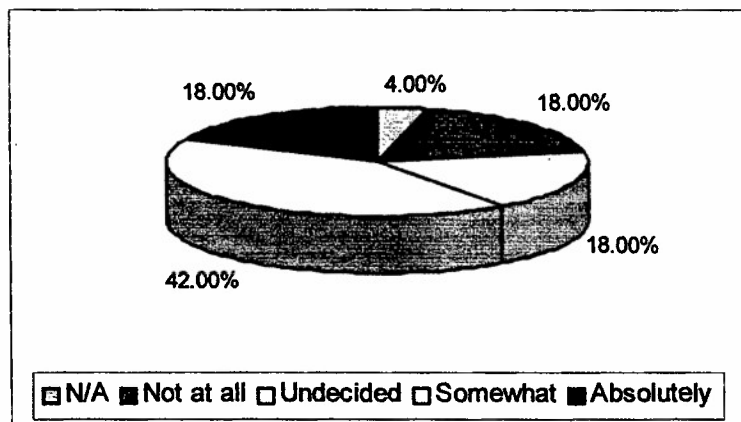


Figure 3.13 Manage the time of others

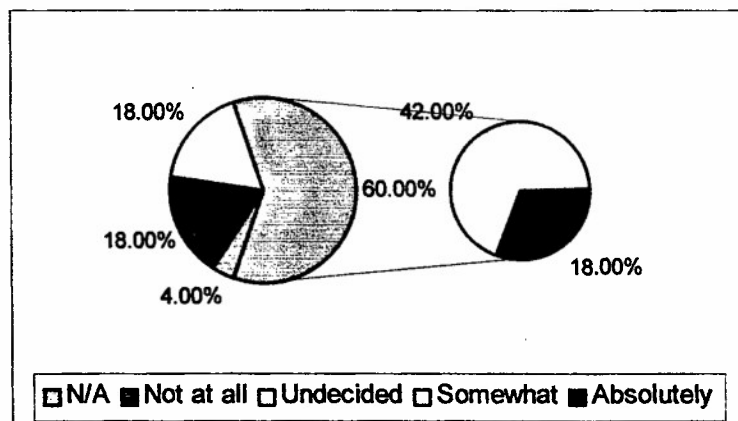


Figure 3.14 Distribution of data for managing others time

Interpretation of Results:

As discussed on the previous graph 84% believe they can manage their own time, but of that 84% only 60% of them believe they are prepared to manage the time of others. This reduction is a very telling fact, it tells us that the students feel they are prepared to leave school but not step into a middle management position in a construction organization. Another perspective on the same data is 36% of those surveyed do not feel they are prepared to manage the time of others.

Question Nine:

My education has empowered me with the tools to properly manage my money.

Numerical Response:

| N/A | Not at all | Undecided | Somewhat | Absolutely |
|-------|------------|-----------|----------|------------|
| 4.00% | 14.00% | 16.00% | 38.00% | 28.00% |

Graphical Response:

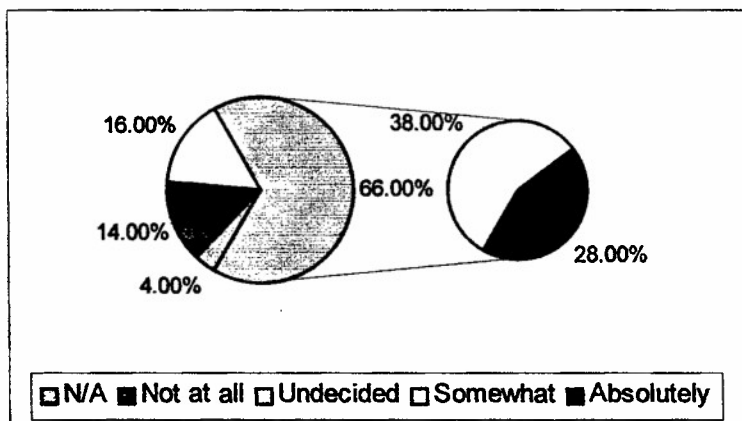


Figure 3.15 Personal money management

Interpretation of Results:

Only 60% of those surveyed believe or somewhat believe they are prepared to manage their own money. 30% do not believe they are prepared to manage their own money.

Question Ten:

My education has empowered me with the tools to properly manage the money of others.

Numerical Response:

| N/A | Not at all | Undecided | Somewhat | Absolutely |
|-------|------------|-----------|----------|------------|
| 4.00% | 16.00% | 20.00% | 44.00% | 16.00% |

Graphical Response:

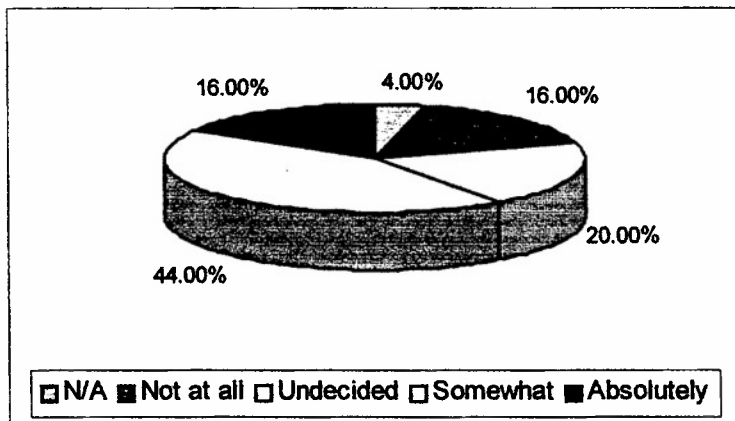


Figure 3.16 Managing others money

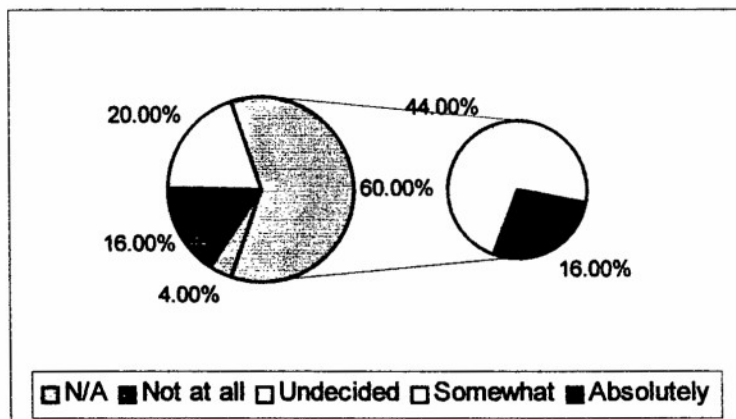


Figure 3.17 Distribution of data for managing others money

Interpretation of Results:

60% of those surveyed believe they are prepared to manage the money of others and 36% do not believe they are prepared manage the money of others. This is a very telling fact because middle manager engineers predominately are concerned with and control of the tracking, distribution, and status of money on a construction project which is by definition someone else's money.

Question Eleven:

Do you feel the subjects of Leadership and Management was adequately covered during your education?

Numerical Response:

| Yes | No |
|--------|--------|
| 18.00% | 82.00% |

Graphical Response:

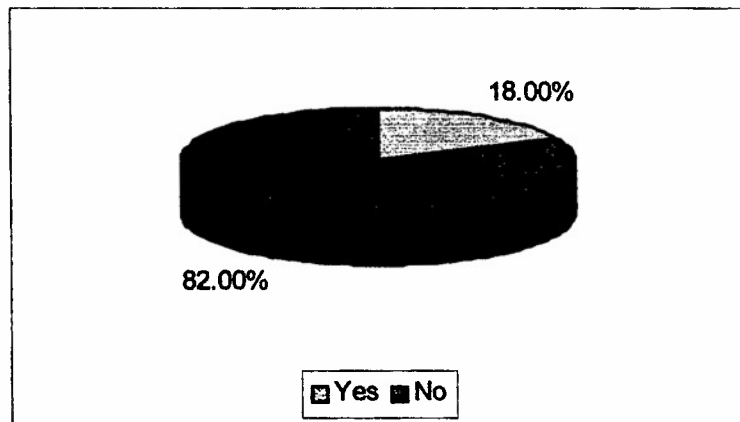


Figure 3.18 L&M adequately covered during education

Interpretation of Results:

Overwhelming majorities 82% to 18% believe Leadership and Management was not adequately covered during their education. This is interesting because as discussed on the previous graphs many of the students believe they are prepared as individuals but they acknowledge that additional Leadership and Management training is required.

Question Twelve:

Do you feel additional courses in Leadership and Management is required? Y/N, If yes during Grad/Undergraduate.

Numerical Response:

| Yes | No |
|--------|--------|
| 74.00% | 28.00% |

| Grad | Undergrad | Both |
|--------|-----------|--------|
| 48.65% | 29.73% | 21.62% |

Graphical Response:

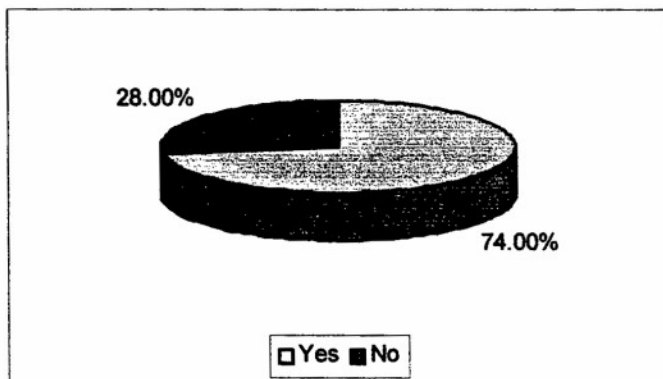


Figure 3.19 Feel addition courses are required in L&M

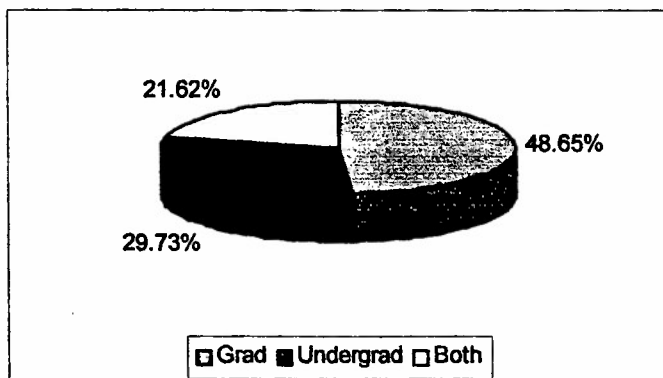


Figure 3.20 Courses during graduate or undergraduate

Interpretation of Results:

74% of those surveyed believe additional courses in Leadership and Management is required. And of that 74% nearly half believe this training should happen as part of graduate school. An additional 30% believes additional courses should be added to both the undergraduate and graduate programs. This is interesting because my research shows that most co-op opportunities are during undergraduate education.

Question Thirteen:

Do you believe your education has prepared you for a position as a manager in a construction organization?

Numerical Response:

| Yes | No |
|--------|--------|
| 34.00% | 66.00% |

Graphical Response:

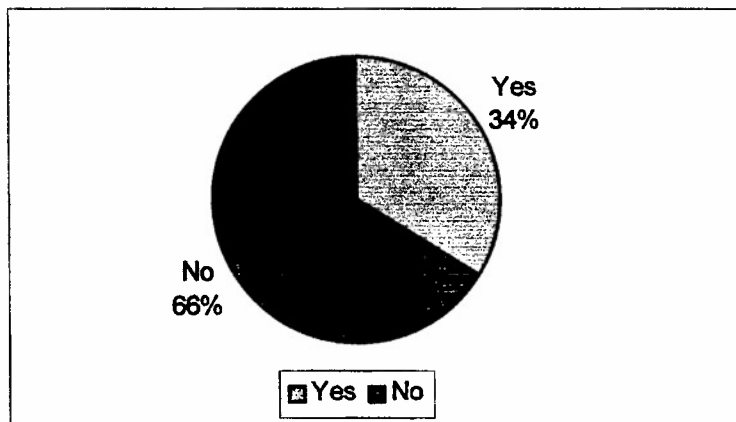


Figure 3.21 Manager in a construction organization

Interpretation of Results:

This is a very scary graph because 66% do not believe they are prepared for a position as a project manager.

Question Fourteen:

Would you participate in an Engineering/Construction Co-op if it were available?

Numerical Response:

| Yes | No |
|--------|--------|
| 74.00% | 26.00% |

Graphical Response:

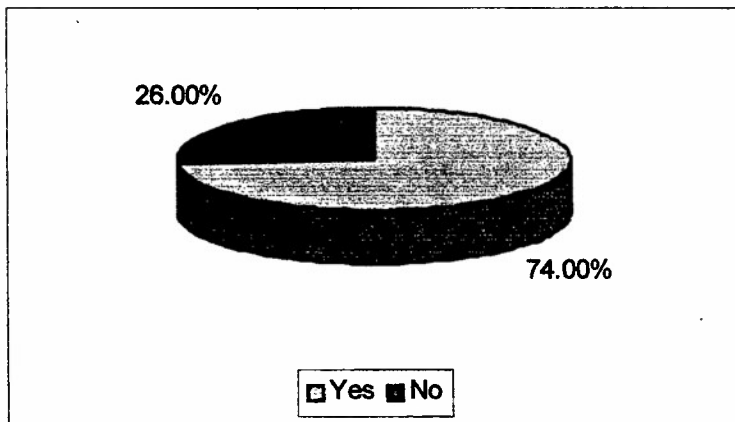


Figure 3.22 Participate in Co-op

Interpretation of Results:

74% of those surveyed would participate in a co-op if available.

The following quotes were taken from the comment section of the survey:

Do you feel additional courses in Leadership and Management are required?

- You can learn it from observing others when you start working.
- Yes
- Course in motivating people and communication.
- Course in Leadership.
- Leadership in the construction industry.

Any other changes you would make to enhance the learning process.

- More relevant construction and engineering topics.
- All college programs should be mandated to have a Co-op program.
- More hands on.
- Some hands on experience.
- I would work leadership topics into our professional issues class.
- Give more practical courses, such as: permitting, the Public Agencies, Preparing Construction Drawings, etc.
- More Practical.
- Require work experience before graduating.
- More courses in proposal writing.
- Require Co-op.

Section Four: Recommendations

- Full Co-op
- Do Nothing
- Hybrid

Recommendations

As discussed earlier this is a very complex issue and the solutions to complex issues are typically very complex. The data from the surveys can be manipulated and turned to say just about anything. So any recommendations made from this survey are very subjective to the individual interpretation of the raw data. But I do believe one thing is clear, the students surveyed believe there is definite room for improvement. I have categorized the possible solutions into three different sections; the "do nothing" section, the "full Co-op" section, and the "Hybrid" section. There are over 885,000 Internet links under the search "Construction Leadership". Most of these fall into two groups; the Co-op web sites for Universities all over the world and the promotional web site for on site seminars. Seminars range from one day to a week and focus on specific aspects of Leadership and Management. The customer base for these seminars is from all aspects of the construction industry.

Full Co-op

Of the over 885,000 web sites under the search "Construction Leadership" by far a majority of them are University web sites describing their Co-op programs. Appendix "B" is a listing of some of the more interesting Co-op models. A majority of those sites reviewed are for Co-op programs during undergraduate education. Of the hundreds of web sites reviewed only a couple actually focused on a Co-op for a Masters program. Arizona State University calls their Co-op "Corporate Leaders Program" and it combines the pursuit of a Masters degree with leading edge work experience. Cornell University's Co-op Program is popular among undergraduate students because it provides them with eight months of actual work experience over the course of a college career. Duke University sponsors several seminars, which are, designed as implementation-oriented workshops, which are taught in small groups with an emphasis on personalized and practical applications. There are literally hundreds of different Universities with a Co-op Program.

Do Nothing

This solution is the easiest and most cost effective of the options. It suggests that the status quo be maintained and that the academic advisor deal with student experience on a case by case basis and assist only those students that desire part time work. The University of South Florida has a similar program where the academic advisor maintains an up to date listing of University alumni and then joins them with students who display a willingness to participate in part-time and summer work. The University of South Florida also participates in the annual Leaders of the Future Conference (LOF) which is a national conference for students and industry. This type of program is best suited for Universities with small numbers of students who are not large enough to fund a full-fledged Co-op. This section was called the "Do Nothing" section because it really doesn't accomplish much in the way of global change in the industry. It maintains the status quo.

Hybrid

This section is titled Hybrid because it takes the best ideas from the other sections. The premise is simple. The Co-op will be during the student's Master's Program; the intent is to add practical experience without extending the duration of the Program. A typical program would be like this:

| | |
|--------------|----------|
| Fall | 12 Units |
| Spring | 6 Units |
| Summer Co-op | 2 Units |
| Fall | 12 Units |

The work experience would start part time during the spring and would move to full time during the summer. This would provide up to eight months of experience. The student would be required to write his/her Master's report during the summer, which would alleviate the mad rush of procrastinating of Master's report, which happens now. The other intriguing idea would be to tie the Master's report to the work experience. The report could discuss the courses taken during the fall and spring and apply them to the construction organization where they are employed. This would have several benefits: first, it gives an immediate benefit to the employer. Students

who are working for them who are simultaneously reviewing their organization and comparing it to the leading edge technology being taught at the University. Secondly, This course comparison to an actual construction organization gives real time feedback to the University on their curriculum. This seamless feedback would insure the University is focusing on the real problems of the industry. There are many challenges to this type of system. The most glaring is resources. Most Universities who have a Co-op have a dedicated person running the Program. This is mostly to liaison between the industry and the students. It is also required because of the level of effort required to find new businesses for the program. My recommendation would be to slowly grow into a full program. Start by giving the students an option requiring them to find their own position and over time it would grow into a full program.

Section Five: Conclusion

Section Five: Conclusion

The data collected and analyzed in Section Three clearly shows that there is significant room for growth in the development of Leadership and Management skills at the University level. One of the students surveyed responded to the question: do you believe additional courses in Leadership and Management is required with this quote; "I will learn everything I need by observation once I get to the job site". This attitude which is a prevailing attitude in the industry will do two things; delay the individual growth and development of the young engineer and it will also insure that all of the bad habits and problems that currently exist within the industry will survive and continue.

If additional training and practical experience in Leadership and Management skills is going to be affective it must be presented in a new and different way. If we as an industry continue to do what we have always done, we will continue to achieve the same results we have always achieved. To truly change the industry something different will be required. I believe the development of Leadership and Management skills will be at the center of the change. As dollars continue to get tight and time is

of the essence, the engineer who can utilize his/her skills to motivate and lead the workforce to a successful project completion will find success. Construction organizations will pay a premium to a young engineer who possesses these talents. The talent and skills of Principle Centered Leadership and Management is honed in two ways; first, by being exposed to the different styles and traits of leadership and Management, this is done in the classroom. Secondly, by practical experience, the more experience the better the engineer. I believe this report is the first step in developing a Co-op Program. It brings the perspective of the student to the forefront and they believe that additional training and experience in Leadership and Management is required. What is the next step? I believe a committee consisting of professors, administrators, and students should get together and develop a strategic plan detailing the ideals and criteria for the Co-op Program. Once this is done a detailed research of existing Co-op Programs from other Universities should be done. Looking for the University which has similar criteria in their Program. Contact should be made with this University to review their lessons learned to insure a smooth transition for our Program.

Section Six: Lessons Learned

Lessons Learned

- Survey Alumni to see if their perspective on Leadership and Management has changed since being on the job.

This is an important concept because the current survey is of students who have not been on the job. Their perspective on Leadership and Management and their education might change after they have been in the work force for period of time.

- Survey other Universities to verify the trend is universal and not something specific to the University of Florida. Also, determine what other Universities are doing Co-op programs and find the model that fits the University of Florida.

- Survey other colleges within the University of Florida to see if the survey results cross over. Examples, GIS students, BCN students, etc.

- Deeper research into the foundation of a full fledged Co-op. Research potential participants, set-up the guidelines for the program. Cost, manpower, etc.
- More focus on the statistical validity of the survey.
- Procrastination in writing the Masters Report:
Establish and hold realistic accountable milestones.

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Biography

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The Memory Jogger Plus+, Michael Brassard, 1989

The Team Handbook, Peter R. Scholtes, 1988

Deming Management at Work, Mary Walton, 1991

Biography

LT Joseph Michael Molnar Jr., CEC, USN. [REDACTED]
[REDACTED]

[PII Redacted]
[REDACTED]
[REDACTED]

Enlisted in the Navy as an Engineering Aide in November 1978. Completed 11 years of enlisted service which included two tours with Construction Battalion Units in Great Lakes and San Diego and a four-year tour with Naval Mobile Construction Battalion 40, homeport Port Hueneme, CA. Successfully completed two deployments to Guam and one to Rota, Spain.

Received an Associates Degree in Engineering through the Enlisted Education Advancement Program from Ventura County Community College in Ventura, CA. Received a Bachelor of Science in Engineering Degree through the Enlisted Commissioning Program from California State University at Northridge.

Commissioned an Ensign in December 1989. After Civil Engineer Corps Officer Basic School, assigned as the Assistant Resident Officer in Charge of Construction at Naval Air Station Brunswick, Maine. Significant accomplishments include the complete renovation of 276 Government housing units, the completion of the first design build Child Development Center, and the construction of a state-of-the-art Airfield Refueling Center.

Selected as the Officer in Charge Special Programs Field Office for the White House. Primary duties included support liaison for presidential support of the President's secondary residence. Responsible for the retrograde of Presidential support facilities for President Bush's estate at Kennebunkport, Maine. The primary location of the field office is Camp David, where duties included the contractual oversight of all construction work at the Presidential Retreat.

Recently completed assignment as the Assistant Public Works Officer for the Commander U.S. Naval Activities, United Kingdom. Supervised a workforce of 100 diverse employees including US military, GS civilians, and British civilians. Managed the maintenance and repair of 1.5 million SF of facilities including CINCUSNAVEUR Headquarters.

Currently assigned to post-graduate school at the University of Florida studying Construction Management.

Married to the former Constance Louise Fullenwider on 16 March 1980: three sons, Zachary (18), Nicholas (11), and Cameron (8).

Student Leadership Survey

Name: _____ (optional)

Age: _____

Sex: M/F

Education

Undergraduate Degree in: _____

Masters Program: _____

Do you have your EIT: Yes/No

Do you have your PE: Yes/No

If yes, which state: _____

Are you currently a full time student: Yes/No

I graduate in: _____

Employment History

Are you currently employed: Yes/No

Is your Job in the Construction Industry? _____

| Motivation: | N/A | Not at All | Undecided | Somewhat | Absolutely |
|--------------------------------------------------------------------------------------|-----|------------|-----------|----------|------------|
| 1. Are you currently motivated for a position in the Construction Industry? | | | | | |
| 2. Do you feel your education has prepared you to motivate workers on the job? | | | | | |
| Leadership: | | | | | |
| 3. Do you feel you are prepared to be a leader in the Construction Industry? | | | | | |
| 4. Has your education adequately presented the different types of leadership styles? | | | | | |
| Accountability: | | | | | |
| 5. My education has taught me to identify and how to do the right thing. | | | | | |
| 6. I feel I have the tools to problem solve a work process. | | | | | |
| Management: | | | | | |
| My education has empowered me with the tools to: | | | | | |
| 7 properly manage my time. | | | | | |
| 8 properly manage the time of others. | | | | | |
| 9 properly manage my money. | | | | | |
| 10 properly manage the money of others. | | | | | |

Student Leadership Survey

Name: _____ (optional)

Age: _____

Sex: M/F 40/10

20-25

26-30

31-35

36-40

41+

Education

29

9

7

3

2

Undergraduate Degree in: _____

Masters Program: _____

Do you have your EIT: Yes/No 35/15

Do you have your PE: No/Yes 45/5

If yes, which state: _____

Are you currently a full time student: Yes/No 44/6

I graduate in: _____

Employment History

Are you currently employed: Yes/No 31/19

Is your Job in the Construction Industry? _____ N/Y 19/12

| Motivation: | N/A | Not at All | Undecided | Somewhat | Absolutely |
|--------------------------------------------------------------------------------------|-----|------------|-----------|----------|------------|
| 1. Are you currently motivated for a position in the Construction Industry? | 1 | 6 | 6 | 13 | 24 |
| 2. Do you feel your education has prepared you to motivate workers on the job? | 2 | 8 | 10 | 23 | 7 |
| Leadership: | | | | | |
| 3. Do you feel you are prepared to be a leader in the Construction Industry? | 3 | 4 | 3 | 22 | 18 |
| 4. Has your education adequately presented the different types of leadership styles? | 3 | 20 | 9 | 15 | 3 |
| Accountability: | | | | | |
| 5. My education has taught me to identify and how to do the right thing. | 1 | 4 | 7 | 29 | 9 |
| 6. I feel I have the tools to problem solve a work process. | 1 | 0 | 3 | 20 | 26 |
| Management: | | | | | |
| My education has empowered me with the tools to: | | | | | |
| 7 properly manage my time. | 2 | 5 | 1 | 17 | 25 |
| 8 properly manage the time of others. | 2 | 9 | 9 | 21 | 9 |
| 9 properly manage my money. | 2 | 7 | 8 | 29 | 14 |
| 10 properly manage the money of others. | 2 | 8 | 10 | 22 | 8 |

Comments:

Do you feel the subjects of Leadership and Management were adequately covered during your education? Y/N
9Y, 41N

Do you feel additional courses in Leadership and Management are required? Y/N, if yes during Grad/Undergrad.
More courses in: 37Y, 14N 8 Both 18

11

Describe your experience working in the construction industry?

Do you believe your education has prepared you for a position as a manager in a construction organization?
17Y, 33N

Would you participate in an Engineering/Construction Co-op if it were available? Y/N 37Y, 13N

You are King for a Day:

What courses would you add or delete in your Education Program?

Any other changes you would make to enhance the learning process?

Additional Comments:

Appendix: "B"

University WEB Sites:

Arizona State University: www.eas.asu.edu

Cornell University: www.engr.cornell.edu

Duke University: www.awma.org

Ohio State University: www.career.eng.ohio-state.edu

Texas A&M University: www.co-opweb.tamu.edu

University of Alberta: www.info.engg-coop.ualberta.ca

University of Maryland: www.umuc.edu

University of South Florida: www.ead.eng.usf.edu

University of Victoria: www.coop.uvic.ca

University of Washington: www.engr.washington.edu

University of Waterloo: www.adm.uwaterloo.ca



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As dramatic changes unfold around the world, it is becoming clear that tremendous opportunities exist for a new generation of leaders here in North America. People who understand technology are needed in our increasingly high tech societies to play a greater role in decision making in corporations and communities across the continent. We are looking for these leaders of the future and, through a highly competitive process, can offer winners the chance to participate in a unique leadership development program that will change their lives.

Richard D. Filley, Director

You are visitor number **003419** since April 26th, 1997.
Please send your comments to leaders@asu.edu



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Introduction and Overview

About ASU Corporate Leaders Program

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About ASU Corporate Leaders Program

The ASU Corporate Leaders Program, founded in 1986, offers unique career change opportunities to talented engineers, computer scientists, and technologists. All of our programs combine pursuit of a master's degree with leading edge work experience, and participation in one of the nation's top leadership development programs for engineers and the technology savvy.

The Industrial, Business, Technology, IMOT, and US WEST Entrepreneurial Fellows selected to participate in our 1995-96 program will be chosen in a national competition, with finalists being flown to Phoenix for on-site interviews. Winners receive a salary, benefit, and tuition package worth well over \$57,000, making it one of the most valuable awards offered to graduate students in the United States. Our 1995-96 program opportunities include the following:

Industrial Fellows Program. For those interested in earning a master's degree in computer science, or chemical, electrical, industrial, mechanical or bioengineering. Current and past program sponsors include Honeywell Commercial Flight Systems Group, Honeywell Industrial Automation & Control Division, Honeywell Space Satellite Operations, Motorola Government Systems & Technology Group and Motorola Semiconductor Products Sector.

IMOT Fellows Program. For those interested in participating in a unique dual master's degrees program, earning an engineering master's degree in industrial engineering (international management of technology option) at ASU, and master's degree in international management at Thunderbird, the American Graduate School of International Management. Program sponsors include American Express Travel Related Services.

US WEST Entrepreneurial Fellows Program. For those interested in earning a master's degree in engineering or computer science and working for a small, high tech organization. Current small business participants include the Arizona Technology Incubator, Bowers Worldwide Travel Management, Landiscor Aerial Information, Senova, and Simula Government Products, Inc. IMOT, MBA, technology, civil engineering, and architectural options may also be available.

Business Fellows Program. For those interested in earning an MBA. Current program sponsors include Phoenix Logistics and Simula Government Products, Inc.

Technology Fellows Program. For those interested in earning an MS degree in technology.

Corporate Fellows Program. For those interested in remaining with their current employer while earning a master's degree (engineering, IMOT, or MBA) and participating in our unique leadership development program for engineers. Employers located outside the Phoenix metropolitan area may

participate. Contact the program office for more information.

About Arizona State University

Arizona State University (ASU) is the nation's fifth-largest university. Of ASU's 43,000 students, 11,000 are pursuing graduate study. ASU's main campus comprises nearly 700 acres and offers outstanding physical facilities to support the University's educational and research programs. Included within the more than 125 buildings are twelve colleges and schools, a University-wide computer system, seven libraries (including an \$8-million building dedicated solely to the Noble Science and Engineering Library), and more than two dozen specialized centers of research. ASU's commitment to permanently establish itself as a major research institution is demonstrated by the construction and acquisition of research facilities and resources as well as the addition of new research faculty and staff.

Arizona State University provides an opportunity for students from all racial, cultural, and economic backgrounds to pursue a full range of high-quality academic programs. The university actively seeks to have reflected within its student body and among its employees the rich diversity of cultures found within the state, the nation, and the world.

As a leading public university, Arizona Sate University's goal is to become a world-class university in a multicampus setting, one of the very best public universities in the nation. To become competitive with the very best public universities, the institution recognizes that it must offer quality programs at all degree levels in a broad range of fundamental fields of inquiry. ASU will continue to dedicate itself to superior instruction, to excellent student performance, to original research, creative endeavor, and scholarly achievement, and to outstanding public service and economic development activities.



Engineering Cooperative Education Program

INTRODUCTION

A popular option available to undergraduate students in Cornell's College of Engineering is the Engineering Cooperative Education Program. Those who participate in this program will spend eight months of their college career working off-campus in an engineering position. On the job, participants will work on engineering design projects or other carefully monitored work assignments that integrate their academic and career interests, as well as the interests of the sponsoring company. This experience adds a dimension to undergraduate education that cannot be found in classrooms or textbooks.

Students value the co-op program because it offers them an opportunity to gain practical experience in a paid position without delaying their graduation. The program also helps students clarify their interests and abilities. Faculty members endorse the co-op experience because it increases students' enthusiasm and motivation. Companies benefit from the technical work accomplished, their interaction with university faculty and staff, and the endorsement of co-op participants.

ELIGIBILITY

Eligible students include those in all nine engineering fields (ABEN, CEE, ChE, CS, EE, EP, ME, MSE, and ORIE) and CS majors in the College of Arts and Sciences. Transfer students who can work out acceptable schedules with their advisors are also eligible to participate. All students must

have a grade-point average of 2.7 or above after the first semester of their sophomore year.

CO-OP CYCLE

Students apply as fall-semester sophomores and interview the following February. Co-op participants begin the program the summer after their sophomore year by taking their fall-semester junior-year courses on campus during the co-op summer session. They begin their first work term in late August, then return to campus for spring semester of their junior year. Students complete their second work term the following summer before returning to Cornell for their senior year.

BENEFITS

The great thing about co-op is that everyone benefits.

Employers Gain:

- a cost-effective screening tool for recruiting
- a continuous pool of high-achieving students
- novel ideas/input
- public relations via word-of-mouth when co-op students return to campus
- positive relationships with Cornell
- experienced employees when co-op graduates are hired in permanent positions
- greater retention of newly hired employees

Students Benefit From:

- practical, hands-on experience
- applying classroom knowledge to real-world situations
- working with colleagues in a professional atmosphere
- interview experience
- opportunities to test out interests and goals
- better grades, more often than not, as work experience helps students relate theory to application
- sharpening analytical abilities
- receiving more full-time job offers before graduation than other seniors
- carefully monitored work assignments
- greater job satisfaction
- average salaries during co-op terms of \$2,300/month

Cornell University

148 Olin Hall

Ithaca, NY 14853-5201

Phone: (607) 255-3512

Fax: (607) 255-0808

E-mail: Engr_coop@cornell.edu

Web site: < www.engr.cornell.edu/ss/epp/

STAFF

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Created October 17, 1995

Last modified September 24, 1998



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Duke University Management & Leadership Program for Scientists and Engineers

Be part of an exciting, new pilot program as A&WMA and Duke University team up to bring you the innovative Management & Leadership Program for Scientists & Engineers.

Whether you find yourself a "sudden" manager or would like to enhance your leadership skills, you're sure to learn the secrets of successful managers as Dr. Bob Kenney of Duke University presents "Skills for Influential Leadership" and "Managing Multiple Priorities and Your Time" These are designed as implementation-oriented workshops taught in small groups with an emphasis on personalized and practical applications.



Register early for these workshops, which will be offered on Saturday and Sunday. Plan to attend one or both! Earn credits towards A&WMA/Duke's forthcoming Management & Leadership Program for Scientists & Engineers certificate. Look for the Duke section on the registration form.

These courses have a separate fee structure than other courses offered at the 1999 Air & Waste Management Association's Annual Meeting. [Click here](#) to view the list of fees.

One-Day - Saturday, June 19, 1999

DUKE-1 - Skills for Influential Leadership

Instructor: Dr. Bob Kenney, Duke University

Your ability to help others buy into and commit to your suggestions is crucial. This workshop will help you explore why some leaders are more influential than others; assess your own leadership style and learn how to use the power of language to positively influence people and results with greater confidence. You will also learn influence strategies by aligning your influence strategy with the specific needs of your target audience.

One Day - Sunday, June 20, 1999

<http://www.avma.org/AM99/courses/dukeclas.htm>

5/4/99

One-Day - Sunday, June 20, 1999

DUKE-2 - Managing Multiple Priorities and Your Time

Instructor: Dr. Bob Kenney, Duke University

Many people find themselves being pulled in different directions and wishing there were more hours in the day to complete all that they need to do. Participation in this workshop will allow you to more clearly identify how you currently spend your time; develop a focus on high-priority job assignments; create a personal time and priorities management plan; involve others in helping you better manage your time; eliminate or better manage your biggest time wasters, such as the telephone, drop-in visitors, crises, procrastination, unnecessary meetings, the inability to say "no," personal disorganization, perfectionism, travel; and be sure you are not someone else's time waster.

Per course Registration Fee Structure:

| Early Bird | | Pre-Registration | | On-Site | |
|------------|------------|------------------|------------|---------|------------|
| Member | Non-Member | Member | Non-Member | Member | Non-Member |
| \$450 | \$575 | \$495 | \$625 | \$575 | \$725 |

No student rates to be offered on Duke courses.

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ENGINEERING CO-OP & INTERNSHIP PROGRAM

 *The experience you need for the career you want!* 

For Students

- [Student Services](#)
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For Employers

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For Both

- [Welcome to ECIP](#)
- [Announcements](#)
- [Work Term Calendar](#)
- [Statistics](#)
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This site and other ECIP services to students have been made possible with support from:



E College of
ngineering
The Ohio State University



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- Kappa Theta Epsilon
- Co-op Help



Texas A&M University



Cooperative Education Program

A Service of Texas A&M University Career Center

209 Koldus

Phone: 409.845.7725 Fax: 409.845.0067

email: coophelp@cctr.tamu.edu

Texas A&M University Cooperative Education Career Center

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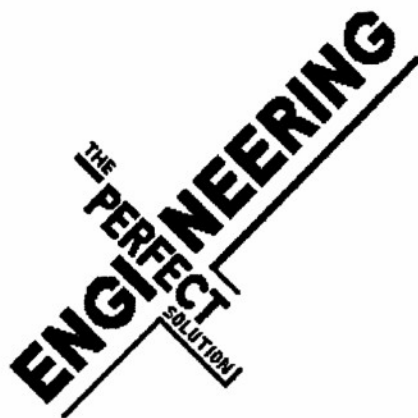
Civil Engineering Co-op Information

The department of civil engineering at Texas A&M University participates in the TAMU Co-op program. The CE program is administered by Lee Lowery, Jr. room 139C in the Civil Engineering Building, phone 845-4395, email: Lowery@tamu.edu.

All students desiring to participate in the co-op program in Civil Engineering must have a GPR or 2.5, or approval of Dr. Lowery, and must have completed their CBK courses and have been admitted to upper level Civil Engineering. The University also requires students to have at least 30 hours of course credit to participate.

There are many advantages to the co-op program, including the money made while working in industry, the engineering experience gained, and the fact that you see the material we are trying to teach you is actually used in industry. Co-op students invariably have a greater appreciation of their course work after returning from co-op assignments, and make better grades as a result. It has also been our experience that co-op students average about \$1500/year better job offers upon graduation. The negative side is that it delays your graduation, and some students are not well suited to breaking into their studies every semester or so, and leaving the University environment.

All students considering the co-op program must attend an orientation session where any and all questions are answered, including how much you can expect to make, how many semesters you must participate, etc. You can find a wealth of information regarding the program at the [co-op web site](#). This site lists when the orientation sessions are offered, and other general information. You can also email the co-op personnel, Mr. Brad Dollet, at Bcollet@cctr.tamu.edu.



University of Alberta

Engineering Co-op Centre

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Links to Company Web Sites

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44549

08/06/98



National Leadership Institute

The National Leadership Institute (NLI) at UMUC plays a major role in developing effective leaders for the workplace. For nearly 50 years, UMUC has designed and conducted programs to help organizations enhance the managerial skills of their leaders.

Today, NLI's wide range of management development activities includes weeklong seminars, targeted workshops, consultation to organizations and one-on-one executive coaching and counseling. All of NLI's programs rely heavily upon rigorous and tested managerial and leadership assessment methods as a basis for needs and performance analysis.

NLI Programs

NLI Program Offerings Include:

- ▼ [1998 Conference: The Art & Practice of Coaching Leaders](#)
 - ▼ [Center for Creative Leadership Programs](#)
 - ▼ [Leadership Application Workshops](#)
 - ▼ [Executive Coaching and Counseling](#)
 - ▼ [Customized Programs and Organizational Consulting](#)
 - ▼ Feedback Newsletter
 - ["Reengineering People: The Human Aspects of Change"](#) (from Vol. 5, No. 9)
 - ["Women in Leadership: Still Facing Barriers"](#) (from Vol. 5, No. 5)
 - ▼ [1996 Leaders and Change Conference](#)
(Proceedings and Video)
 - ▼ [1994 The Myers-Briggs Type Indicator and Leadership Conference](#) (Proceedings)
-

Leadership Application Workshops

Particularly powerful for intact work groups--senior executives, managers and their staffs, cross functional work teams--these intensive one- to three-day programs are designed to help managers apply concepts of effective leadership. Often building on previous leadership development experiences, workshops include such topics as developing and communicating a vision, building high performance teams, managing organizational change, balancing personal and professional roles, and women's advancement in the workplace.

Executive Coaching and Counseling

Especially well suited for senior managers, NLI's highly individualized executive coaching and counseling sessions can address such issues as succession planning, career development strategies and managerial effectiveness. Through assessment instruments and one-on-one consultations with NLI staff psychologists experienced in executive development, NLI can provide a confidential diagnosis of individual development needs, information critical for promotion, a comprehensive evaluation of managerial effectiveness--valuable insights for personal planning and development.

Customized Programs and Organizational Consulting

NLI can customize any of these programs to meet specific individual or organizational needs. This may be as simple as tailoring a program to your specific industry, or may be as complex as responding to your organization's specific business situation.

NLI develops effective solutions by analyzing your business environment, administering pre-and post-program assessments, conducting experiential training programs and designing follow-up activities.

For additional information or to arrange for a free consultation, contact Jody Murphy at:

Phone: (301) 985-7195

Fax: (301) 985-7100

Email: tbjorklu@polaris.umuc.edu

Note: NLI conducts the LDP and FOL in affiliation with the Center for Creative Leadership (CCL). CCL is the preeminent education and research institution devoted to the development of creative leadership and effective management.

Send comments or questions to tbjorklu@polaris.umuc.edu

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University Blvd. at Adelphi Rd.
College Park, Maryland 20742 USA

Send feedback on this site to webmaster@www.umuc.edu



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Committees

The Society offers USF Engineering alumni unlimited opportunities to remain involved with the College and the University after graduation. Your individual talents, strengths, and experience are needed to help preserve our history and shape the future for generations of engineers to follow.

Be Active, Get Involved!

Click on any of the committees on the right to see what they do and how you can participate.

EAS College of Engineering Representatives

Engineering Dean

- o [Michael Kovac](#)

Director of Development

- o [Jo-Ann Alessandrini](#)

Assistant Director of Development

- o [Alicia Slater-Haase](#)

- USF Alumni Association Representative
- Steve Ranieri

Current Leadership Team

| Position | Name |
|-----------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| President | Brenda Elarbee • Mechanical '82 |
| Past-President | Ronald F. Giovannelli • Civil '77 |
| Vice President | Ed Copeland • Civil '73 |
| Secretary | Rebecca Test • Civil '92 |
| Fundraising | Red Clanton , Chair • Civil '82 Bob Murray , Co-chair • Electrical '77 |
| Honors & Awards | Ray Fleming , Chair • Industrial & Management Systems '67 Carol Carter , Co-chair • Civil '97 |
| Membership & Events | Sheila Carpenter van Dijk , Chair • Civil '96 Lenore Hockley , Co-chair • Civils' |
| Student Relations | Sandy Pettit • Chemical '94 Ray Hawat , Co-chair • Computer Science '93 Erika Rosand , Student Representative |
| Classes of the 60's Liaison | Glenn Schneider • Electrical '68 |
| Lifelong Learning Liaison | Brenda Harp , Chair • Electrical '88 TBA, Co-chair TBA, Student Representative |
| Past Officers | Rick Bowers • Civil '91 TBA |
| USF Parent's Association Representative | |

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[[College of Engineering](#)][[Engineering Development](#)][[USF Alumni Association](#)]

Theme

Student Leadership

Project

Student Leadership

Goal

To provide students with opportunities to develop skills related to leadership

Participants

Penn State/all

Key Accomplishments

Students fully integrated into all aspects of ECSEL activities

Assessment

Discussion with students and formal evaluation of WISE and LOF

Abstract

Two programs related to ECSEL which provide formal training to students on leadership are the Leaders of the Future Conference (LOF) and Workplace Integration Skills for Engineers (WISE). LOF is an annual, national conference for students and industry conceived and organized completely by the students. WISE is a non-credit program given on weekends for interested students where they obtain training in interpersonal skills, communication skills and diversity.

In addition to this formal training students are involved in all ECSEL activities including development of classes, teaching, outreach and evaluation. Some specific student activities include:

Teaching Interns - typically 30 interns are used across the College to improve teaching/learning and to interest the interns in academic careers.

Curriculum - students played a key role in the development of E Mch 210 with the integration of design, teams and demos.

Outreach - students participated in outreach to elementary and secondary schools.

Evaluation - students have taken special surveys to evaluate teaching and learning and are in the process of creating a kiosk to obtain additional feedback on all aspects of their education

Opportunities for students to obtain formal training and interaction with industry on leadership is provided annually.



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UVicInfo

UVic Info

University of Victoria Co-operative Education

Co-operative Education formally integrates a student's academic studies with relevant and productive paid work experience with employers in business, industry and government. Employers benefit from having access to a year-round supply of well-trained and highly motivated student employees for short-term projects. Co-op students gain skills and experience which prepare them for the future job market and give them improved employment opportunities upon graduation.

The Co-operative Education Program at the University of Victoria is the third largest in Canada with Co-op Programs in the many areas. Visit the Co-op Programs page for a list of all the areas which offer Co-op, and follow the links to individual program information.

Office of the Director
Co-operative Education Program
University of Victoria
P.O. Box 3015
Victoria, BC, Canada V8W 3P1

Tel: (250) 721-7628
Fax: (250) 721-8996

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Engineering Co-op News

February, 1998

We are pleased to present this, our first web edition of *Engineering Co-op News*, which is intended to keep you abreast of the latest developments in this rapidly growing and exciting co-op program.

Engineering/Computer Science Database Merger

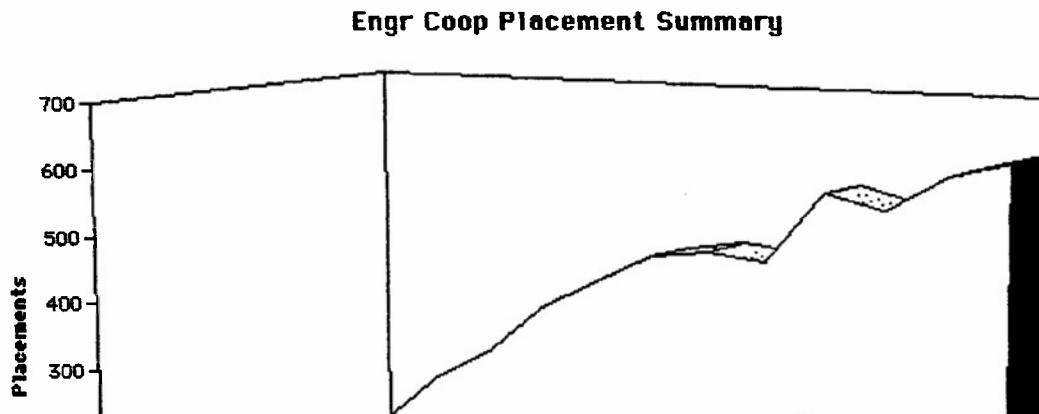
February 5 marked the official celebration of the merger of the jobs database for the Engineering and Computer Science Co-op programs. The ribbon cutting ceremony was attended by Dr. Terry Sherwood, Associate Vice President Academic; Dr. Michel Janisse, Director, Co-operative Education Program; Dr. Michael Miller, Dean of Engineering; Barry Brooks, Manager, Engineering Co-op; Toni Garrett, Coordinator, Computer Science/Math Co-op; and numerous faculty and co-op staff.

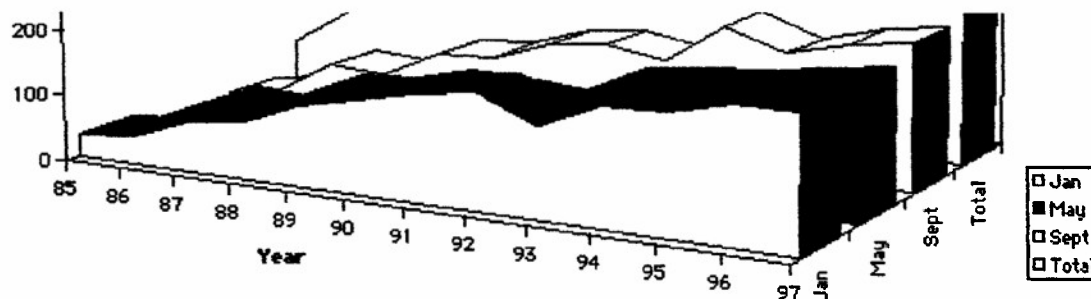
Students from either program are now able to view all job postings on the Internet in each of the areas of computer science, computer engineering, electrical engineering, and mechanical engineering. This ensures that students can view all jobs of interest to them, and that employers will have a wider group of potential applicants.

Co-op Placements

The placement activities for the January - April 1998 work term were highly successful, with 226 students heading out for work terms. This represents an increase of nearly 15% over the same period last year, and is the largest single group of students placed to date. Students are working in British Columbia, Alberta, Saskatchewan, Manitoba, Ontario, Texas, California, Hawaii, Peru, Australia, Singapore, and Malaysia.

A review of our placements from a historical perspective may be seen in the accompanying figure.





To date, Engineering Co-op has placed over **5,250** students in work terms since the program's inception in 1985. These students have collectively earned over **\$42 million**, working in more than 25 countries around the world!

Staff Changes

Larry Varga, Co-op Coordinator since 1992, has taken a leave of absence to accept a position with Nanoose Systems Corp. of Parksville, BC.

Krista Pershall has joined Engineering Co-op on a half-time basis. Krista is also a half-time coordinator with Computer Science/Math Co-op.

For a complete staff listing, visit the [Engineering Co-op Staff](#) page.



[Return to Engineering Co-op News index](#)

UVic Co-operative Education Programs

Faculty of Engineering

University of Victoria



engrcoop@Engr.UVic.ca

Created: Feb. 9, 1998. Last Modified: Feb. 11, 1998 RH

What is Co-op?



Click on any of the following to find out more!

- [Engineering Co-op Staff](#)
- [Affiliated Programs](#)
- [Best Practices Offered By Companies](#)
- [Engineering Student Societies & Organizations](#)
- [Engineering Academic Programs](#)
- [Advisory Board Meeting - April 23, 1998](#)

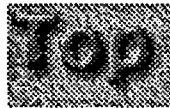
Cooperative Education (co-op) is a learning strategy that allows students to apply theoretical classroom knowledge to practical work experiences. Students traditionally work full-time for a six month period and receive academic credit as well as a salary for their work. Co-op is unique because it is a structured University program administered through the College of Engineering.

Mission Statement: The Co-op Program develops and promotes opportunities that provide engineering students with credit for degree-related, paid work experience.

Engineering Co-op Staff

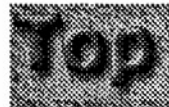
| | |
|-----------------|------------------------|
| Lorena McLaren | Director |
| Wendy Mar | Recruiting Coordinator |
| Abraham Katzman | Office Assistant |

Engineering Co-op Program
353 Loew Hall, Box 352180
Seattle, Washington 98195-2180
Phone: (206) 543-8711 Fax: (206) 616-9752
coop@engr.washington.edu



Affiliated Programs

The Co-op Program works closely with the Minority Science & Engineering Program (MSEP) and Center for Women In Science & Engineering (WISE) to advertise your co-op opportunities. The College of Engineering is committed to promoting diversity in the student body and in the engineering profession.





How the Program Works



- Students apply to the program and attend an Orientation Seminar
- Students submit resume packets
- Students review the list of available positions and indicate their interest
- Resume packets are sent to the employer for consideration
- Employer notifies selected students and coordinates an interview schedule - Opportunities to interview on campus are available upon request
- Employers notify Co-op Office when positions have been filled
- Co-op experience commences - Student submits learning objectives, summary report and technical report to Co-op Office
- Employer evaluates student and student evaluates employing site
- Students return to campus to continue academic studies



Benefits to Participating

By employing co-op students, organizations receive the following benefits:

- a proven, cost-effective method to meet both immediate and long-range human resources needs
- an efficient means to recruit and train new employees
- the opportunity to evaluate candidates under actual working conditions
- the opportunity to hire energetic and enthusiastic employees
- an enriched relationship with the University and its students



Services Available to Employers

1. Candidate information is found in the Resume Packet (Data Sheet, Resume and Transcript). You then select candidates you wish to interview on campus, at your facility, or by phone
2. Interview room(s) to conduct interviews on campus (minimum of 2 week notice required)
3. Database search of qualified students (searches by major and class standing)
4. Guidance in reserving space on campus for Information Meetings
5. To post a full-time position, please contact the Center for Career Services at (206) 543-0535

Top



University of Waterloo - Faculty of Engineering

Placement in diverse work-term positions gives students enrolled in the Engineering co-op programs the training and experience that prepares them for the practical demands of the workplace. In addition to this work-term experience, Engineering co-op students gain a broad technical education while concentrating on one or two specialties of their specific disciplines. These studies give students valuable theoretical, analytical and research skills that are indispensable in any work environment.

Engineering Related Programs

There are eight undergraduate Engineering programs:

- Chemical
- Civil
- Computer
- Electrical
- Environmental
- Geological
- Mechanical
- Systems Design

Work Study Sequence

During their six four-month terms our students should gain progressively challenging assignments to help them develop their initiative, discipline and dependability; develop their abilities to make meaningful contributions to your organization's activities; and improve their interpersonal and communication skills.

The charts shown below illustrate the division of the students into two streams which provide the year-round availability for employment. Before clicking on Work Study Sequence below, note that in order to return to this page use your back arrow on your web browser.

Go to the Engineering [Work Study Sequence Chart](#).

Typical Work Term Assignments

NOTE! This list is not exhaustive.

- **Civil Engineering:** Municipal Design Assistant
- **Electrical, Mechanical, Systems Design:** Engineering Support
- **Chemical:** Process Disturbance Investigation, Process Optimization
- **Geological:** Drilling and Well Technology

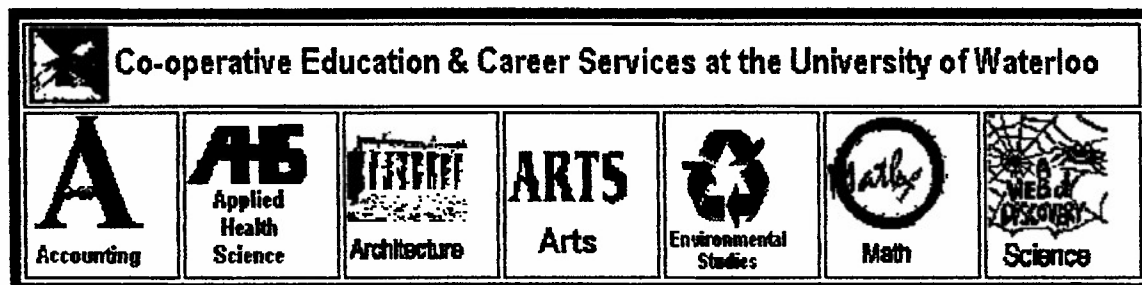
- **Electrical, Computer:** R&D Engineering Support
- **Environmental:** Environmental Engineering Assistant
- **Any Discipline:** Quality Assurance Assistant

For more information, contact: John Westlake, Engineering Co-op Program Administrator.

email: westlake@nhl.adm.uwaterloo.ca

phone: (519) 888-4064 x.2528

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Undergraduate Calendar 1999-2000



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WORK/STUDY SEQUENCE

Faculty of Engineering

Note

The letters A and B denote academic terms

o denotes work term

| Programs By Faculty | Sept - Dec | Jan - April | May - Aug | Sept - Dec | Jan - April | May - Aug | Sept - Dec | Jan - April | May - Aug | Sept - Dec | Jan - April | May - Aug | Sept - Dec | Jan - April |
|----------------------------------------------------------------------------------------------|------------------|-------------------|-----------------|------------------|-------------------|-----------------|------------------|-------------------|-----------------|------------------|-------------------|-----------------|------------------|-------------------|
| Civil, Computer, Environmental (Chemical), Mechanical Stream 8 | 1A | 1B | o | 2A | o | 2B | o | 3A | o | 3B | o | 4A | o | 4B |
| Chemical, Electrical, Environmental (Civil), Geological, Mechanical, Systems Design Stream 4 | 1A | o | 1B | o | 2A | o | 2B | o | 3A | o | 3B | o | 4A | 4B |

o denotes work term.

* Faculty of Education component.

+ Teaching work term

T The Co-op program begins in 2A. However, admission may be made either at the time of initial application or at the end of Year One.

U The Co-op program begins in 2B. However, admission may be made either at the time of initial application or at the end of the 2A term.

V Subject to minimum enrolment targets and availability of suitable Co-op employment, students select a Co-op stream to follow beyond 3B in consultation with their Co-op

@ The programs in Biochemistry, Biology, Biotechnology/Economics, Chemistry, Earth Sciences, Science-Environmental Program, Physics, Science and Business, and the Teaching Option are under review. While the number of work terms and academic terms will not be changed, the sequencing of these terms in Years Three and Four might change.

i/ Normally students study during their 3A and 3B terms in Chicoutimi (Quebec), Nantes or Paris (France). Co-op students whose first work term follows 2A must arrange a volunteer work term during the course of the 3A and 3B terms in France or

employer and Faculty Advisor.

W Students seeking admission must normally have satisfactorily completed two work terms in another Co-op Math program.

X Admission occurs by January for the 2B term.

Y Although the Co-op program begins in 2A, admission is made to the program at the time of the initial application to the University.

Z Admission occurs at the time of selection of second-year courses. Students cannot be admitted to Co-op in first year.

§ Specialization work term

F Point of admission to specialization

» Point of selection of Chartered Accountancy or Management Accountancy Studies

Quebec.

Students admitted to Applied Studies Program 2 will not have a Co-op work term following 1B.

** Anticipated continuation beyond the BA degree program into the one-term Diploma in Accounting program or the first term of the two-term Master of Accounting (MAcc) portion of the five-year integrated Accounting program.

(x) Anticipated continuation beyond the BMath degree program into the one-term Diploma in Accounting program or the first term of the two-term Master of Accounting (MAcc) portion of the five-year integrated Accounting program.

++ Second term of the two-term Master of Accounting (MAcc) portion of the five-year integrated Accounting program.

^ Teaching work term under the auspices of a Faculty of Education

Reg Regular

Off Off Term

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Defense of

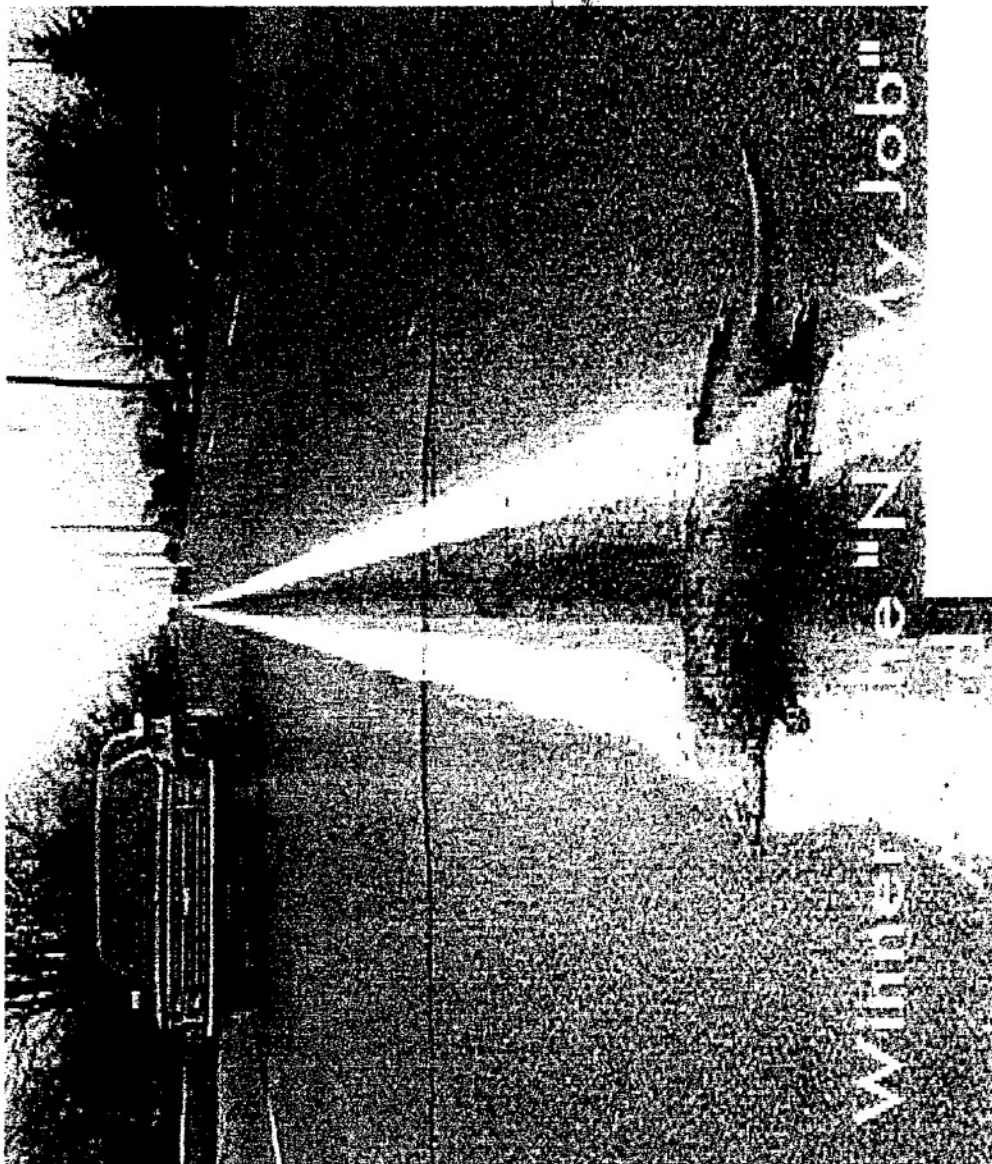


Leadership and Management, the
solution to the Construction
Industry crisis

Joseph M. Molnar Jr.

This presentation will ...

- Summarize the research
- Answer the questions Why and How
the research was accomplished
- Discuss potential Conclusions



Research Breaks down into four areas:

- The crisis in the construction industry
- Defining Leadership
- Survey
- Recommendations
 - Do Nothing
 - Co-op
 - Hybrid

The basis for the crisis in the construction industry is ...

- Business Roundtable
 - Cost over runs
 - Decline in quality
 - Untimely
- Personal experience
- Experience of others

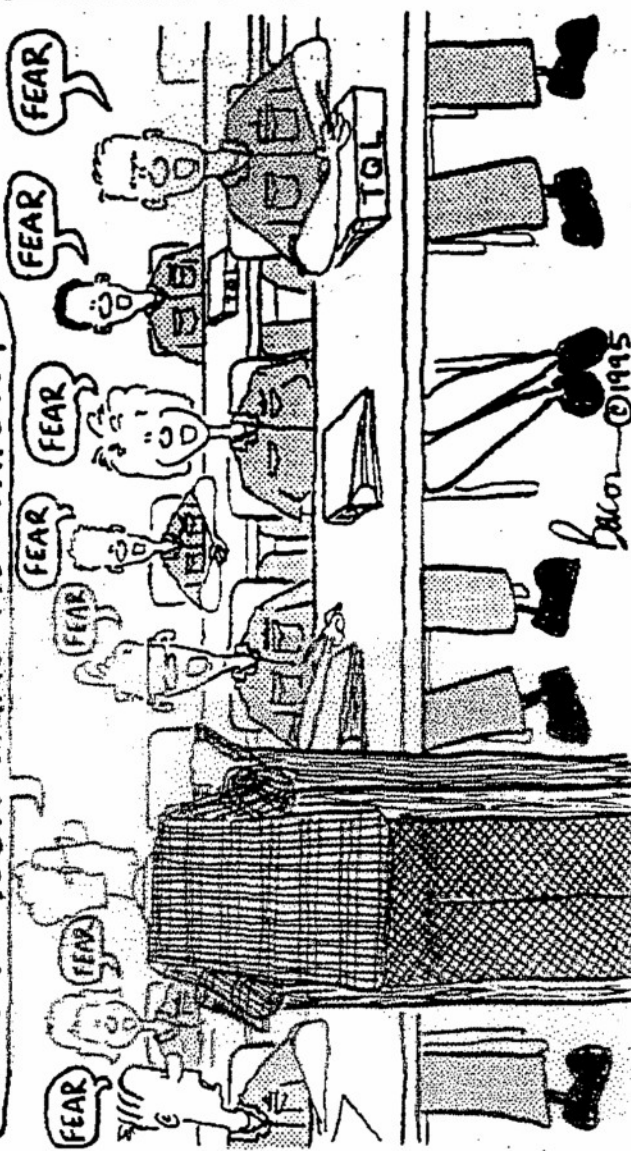
Leadership

- Very Subjective!!
- Principles of Leadership
 - Accountability
 - Integrity
 - Principles
 - Character

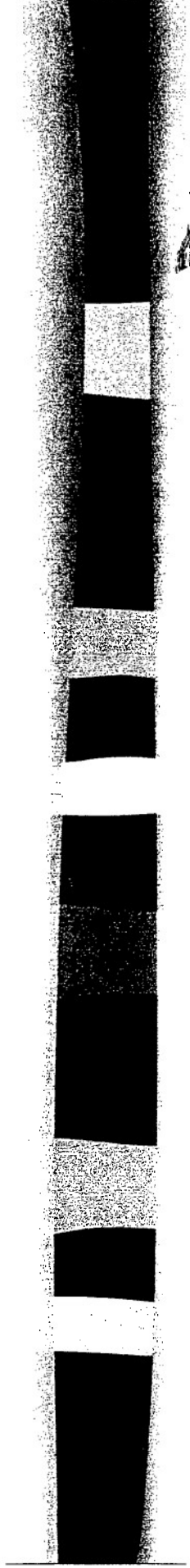
Broadside

NAVY TIMES 15 JAN 96

REMEMBER! WE MUST DRIVE FEAR OUT OF THE
WORKPLACE! INSTEAD, CONCENTRATE ON MOTIVATION.
FOR EXAMPLE, IN YOUR JOBS IN THE NAVY,
WHAT IS YOUR PRIME MOTIVATOR?

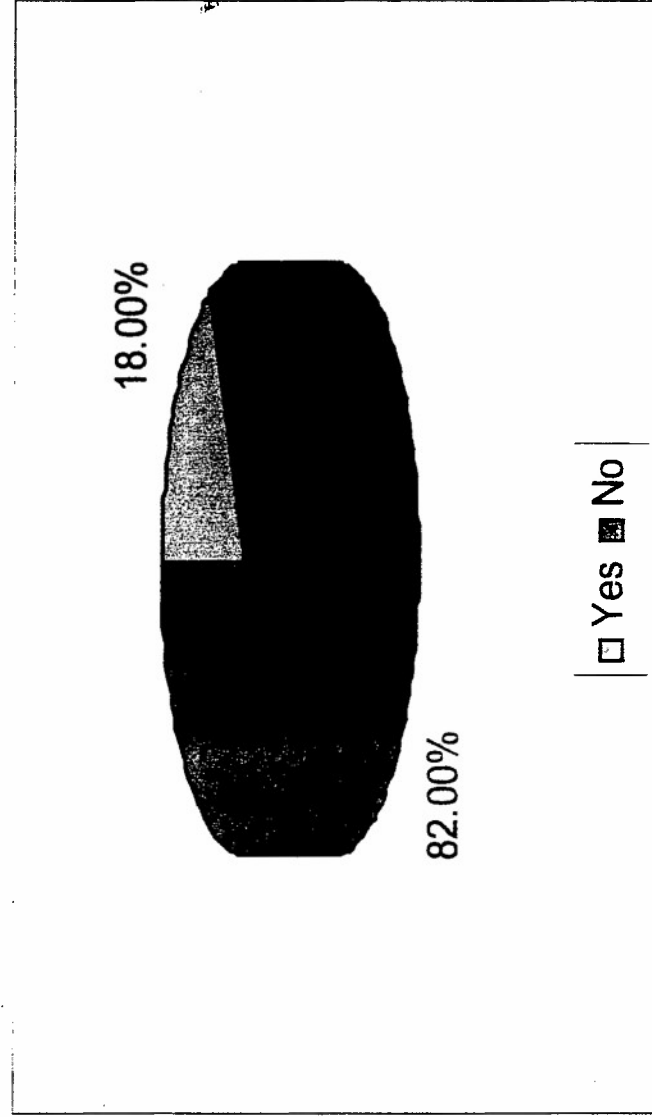


Survey

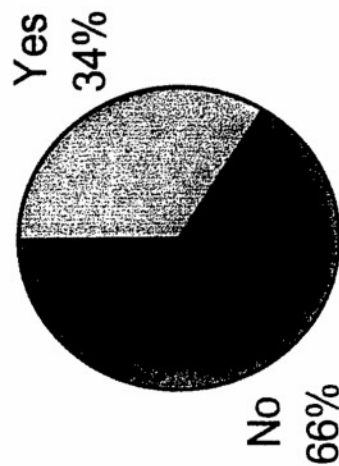


The following slides summarize the survey.

Do you feel the subjects of Leadership and Management were adequately covered during your education?

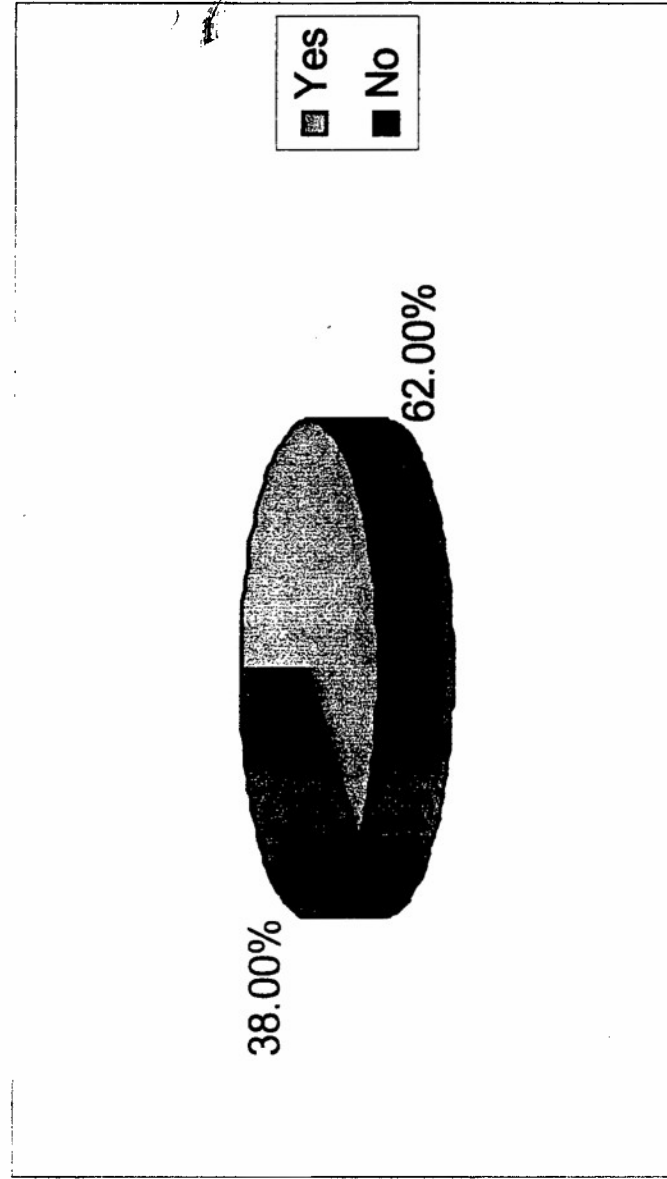


Do you believe your education has prepared you for a position as a manager in a construction organization?

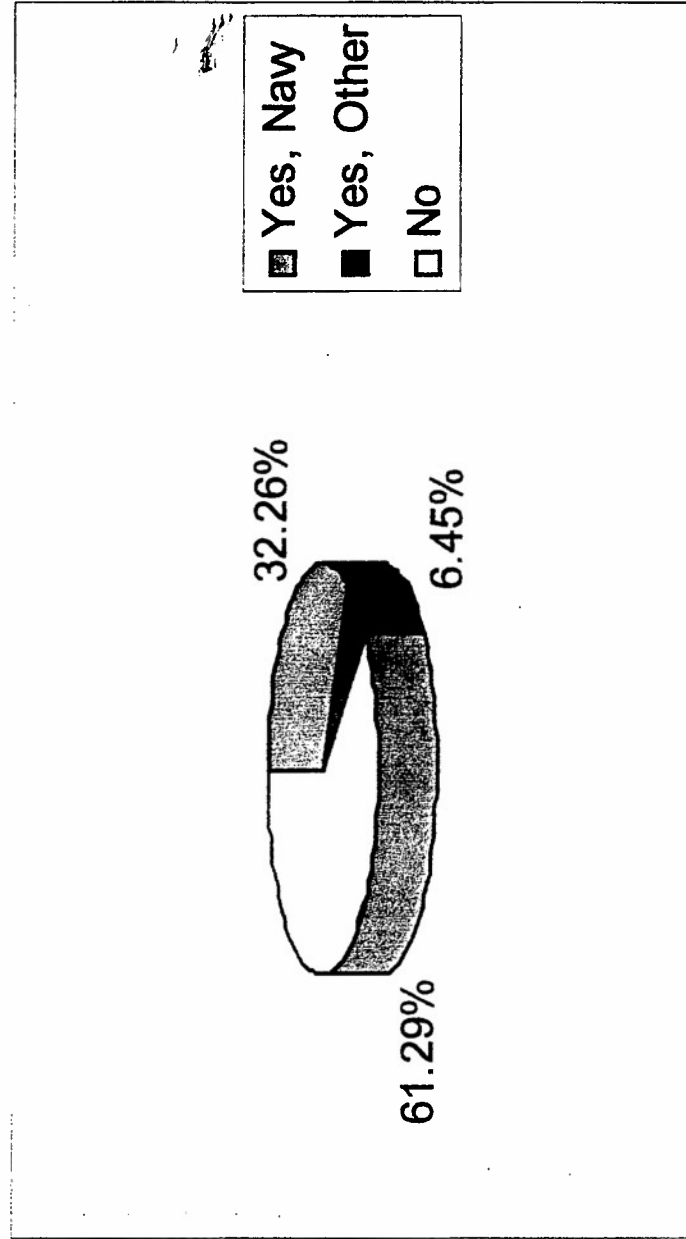


Yes No

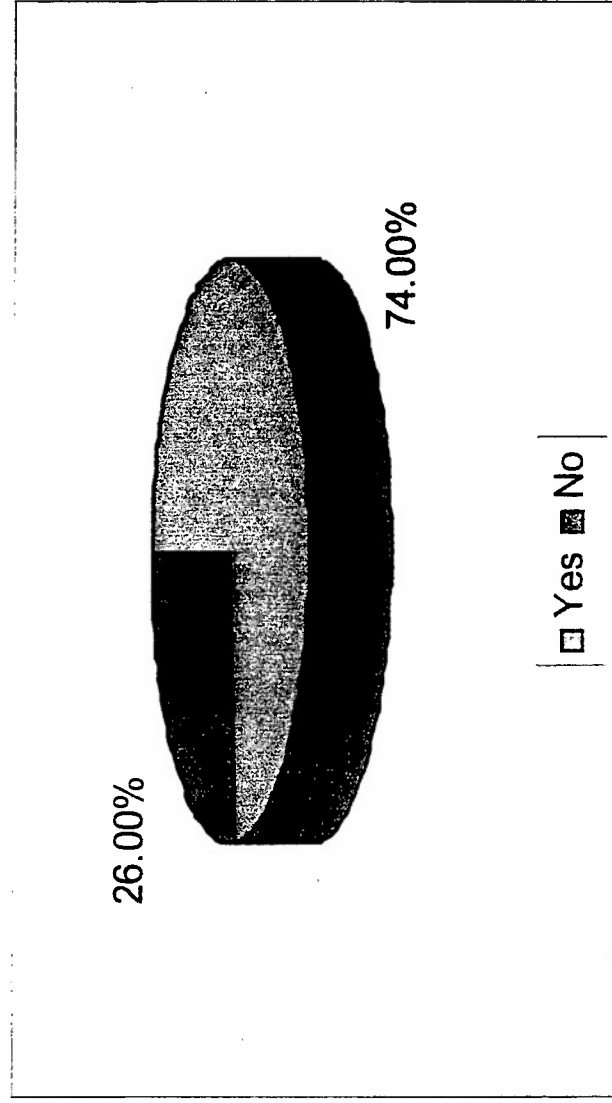
Are you currently employed?



Is your Job in the Construction Industry?



Would you participate in an
Engineering/Construction Co-op if it were
Available?



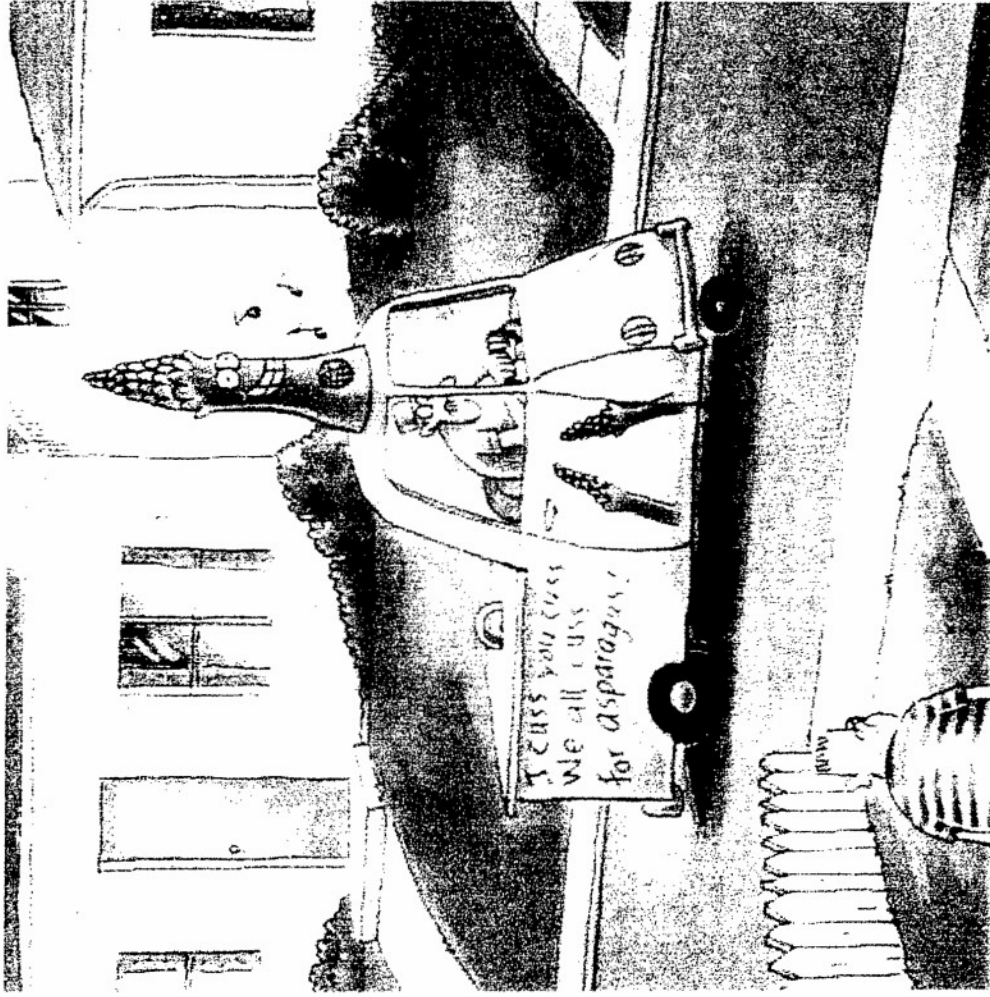
Recommendations:

- Do Nothing
- Co-op
- Hybrid Co-op

In conclusion ...

- The students surveyed believe additional focus on Leadership and Management is required.
- The students would participate in a practical on hands learning experience if available.
- The next step is...

Careful Marketing is required...



Failed Marketing Ploys

Questions???

Comments???

Feedback ???